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A CLASSIFIED LIST OF PROJECTS

CARRIED ON BY

THE AGRICULTURAL EXPERIMENT STATIONS

1919.

UNITED STATES DEPARTMENT OF AGRICULTURE

STATES RELATIONS SERVICE.

Office of Experiment Stations.

A CLASSIFIED LIST OF PROJECTS CARRIED ON BY THE AGRICULTURAL
EXPERIMENT STATIONS, 1919.

In response to widespread interest in the preparation of a list of projects of the experiment stations so arranged as to show where various lines and subjects are under investigation, the following list has been prepared. It includes about 3,750 separate projects of various types and grades, omitting those of a purely administrative or control nature.

The work of assembling and classifying this material has been carried out by Mr. E. R. Flint of this Office, and has proved a more difficult undertaking than was anticipated. This applies especially to the classification so as to bring together or make available for reference all the projects on a given topic. The difficulty has been added to by the broad or indefinite character of many of the titles, and the fact that frequently some of the principal issues are not expressed in them. To relieve the difficulty as far as possible projects relating to more than a single subdivision have been repeated under appropriate subheads, and there has been liberal use of cross-references.

The classification used includes the following main divisions or headings: Chemistry; Meteorology; Botany; Bacteriology; Genetics; Soils; Fertilizers; Field Crops; Horticulture; Seeds and Seed Testing;

Weeds; Forestry; Diseases of Plants; Economic Zoology; Economic Entomology; Foods and Human Nutrition; Feeding Stuffs and Animal Nutrition; Animal Husbandry--Cattle, Sheep and Goats, Swine, Horses and Mules, Poultry; Dairy Farming; Dairy Products; Agrotechny; Veterinary Medicine; Rural Engineering; Rural Economics. Under these are many subheads, arranged alphabetically in case of each main division, except that general projects are placed first and miscellaneous projects at the end of the section. A table of contents will show the arrangement and assist in locating the projects on a particular subject.

In this initial list only the titles have been given for the most part, and no attempt has been made to indicate the author or the source of support. As it relates to the projects in operation in the fiscal year 1919, it is issued in this preliminary form to avoid further delay, and will also be printed in the annual report. A list of the projects for 1920 is in preparation, which it is hoped may supply more detailed information and embody improvements which experience with this one suggests.

E. W. Allen,

Chief,

Office of Experiment Stations.

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The determination and significance of the amino-acid resulting from the hydrolysis of the proteins contained in seeds, grains, grasses, feeds, and foods. Ky.

Fermentation of certain carbohydrates.--Isolation and utilization of fermentation products. To determine the products resulting from the fermentation of various carbohydrates, particularly starch and glucose; influence of various changes in the chemical and physical environment upon the products of fermentation; preparation of ketones from acids formed. Iowa.

Chemical changes in silage. Mont.

A study of the chemical and physical variation of corn silage. Penn.

The composition and properties of silage prepared from the grain sorghum. Okla.

Chemical study of silage made from alfalfa mixed with other green crops. Nebr.

Changes taking place in corn and corn meal when stored under different conditions. Ky.

Chemical changes which take place in cottonseed during growth, and factors affecting same. Okla.

Relation of oil and nitrogen content of cottonseed to other characters. Ark.

Chemical study of the grain sorghums. Okla.

A chemical study of the velvet bean. Ala.

Chemical composition of clover. Mont.

Study of lupulin and other active principles of hops, including effects of high and low temperature in drying upon these principles, and the value of cured hops. Oreg.

Nature and inheritance of chemical constituents of certain vegetable oils. Wis.

Chemical studies, various (Cont.)

Chemical studies of pollen. Minn.

The ash of irrigated and nonirrigated fruits. Idaho.

A study of the chemical composition of fruits during development under varying conditions of treatment. Del.

Influence of climatic factors on the chemical composition of plants. Wis.

The biochemistry of disease resistance in plants. Minn.

A study of the fumigation process with special reference to the chemical problems involved. Calif.

A study of the chemical and physical properties of liquid hydrocyanic acid. Calif.

Chemical studies on animal nutrition and deficiency diseases. Minn.

A chemical study of the nutrition of calves. Ind.

Analysis of dairy products. Wash.

Carbonic acid and carbonates in the udder. N.Y. State.

Study of carbonic acid in milk. N.Y. State.

Study of the chemistry of butter fat and the effect of food in modifying its chemical and physical character. Mass.

Analysis of apples for arsenic. Wash.

The effect of pressure on enzymes. W.Va.

Methods.

Chemical methods for determining the value of agricultural lime and limestone. Ind.

The use of solutions of ammonium citrate for the estimation of reverted calcium phosphate. Mich.

Methods of identification and quantitative determination of borax in fertilizers. N.Y. State.

A study of the determination of moisture in soils and agricultural materials and the nature of the decomposition products given off. S.C.

Organic phosphorus in the soils.--Development of methods for determining. Ohio.

Chemistry, methods (Cont.).

Method for preliminary detection of abnormal milk. N.Y. State.

Method for determination of keeping quality of milk. N.Y. State.

A study of the methods for the determination of sulphur dioxid in dried fruit. Calif.

The development of the calcium acetate method of determining so-called soil acidity and of a simple means of determining soil organic matter content. Vt.

Method of determination of carbon in fresh dung of cattle. Penn. Inst. Anim. Nutr.

Losses of carbon and nitrogen in drying dung and mixed excreta of cattle. Penn. Inst. Anim. Nutr.

Poisonous plants. (See also Botany and Veterinary medicine.)

Chemical study of the toxic principles of Aconitum columbianum. Wyo.

Chemical study of the toxic principle of Delphinium glaucescens. Wyo.

Chemical study of the toxic principle of the tall larkspur (Delphinium glaucum). Wyo.

Determination of the toxic principle of the larkspur (Delphinium glyeri). Wyo.

Chemical study of the toxic principles of Delphinium menziesii. Wyo.

Chemical study of the toxic principles of the seeds and fruits of Lupinus argenteus. Wyo.

Study of poisonous plants affecting sheep.--Woody aster. Wyo.

METEOROLOGY.

Miscellaneous.

Meteorology. Colo.

Meteorological data. Mont.

Meteorological observations. Ariz.

A complete record of the local meteorological conditions and changes. Mass.

Determination of areas in which new crops can be grown, and in which present crops can be easily raised for market much later than has been supposed because of the immunity from frosts. Mass.

BOTANY.

Anatomical studies.

Anatomy of the Chenopodium. N.Y. Cornell.

Anatomy of the Magnoloceae. N.Y. Cornell.

Floral anatomy of the Salicaceae. N.Y. Cornell

Floral anatomy of the Urticaceae. N.Y. Cornell.

Nitrogen assimilation. (See also Legume inoculation.)

Chemical factors involved in the assimilation of atmospheric nitrogen by legumes. P.R.

Studies of nodule-forming bacteria. Mich.

Investigation into the form of nitrogen in the nodules of legumes. Tenn.

Factors that control the infection of legumes by bacteria. Wash.

Accumulation and utilization of atmospheric nitrogen. N.J.

The relation of nitrates to nodule formation. Idaho.

Effect of cross inoculation on the growth of legumes. N.Y. Cornell.

A study to ascertain the necessity for inoculation and the possibility of increasing yields by intercropping with legumes. Ariz.

Nodule organism of alfalfa and its relation to those of sweet and red clover. Ky.

Effect of inoculation of soy bean seed on nitrogen content of plants. Wis.

A test of the value and method of inoculation for soy beans; three different commercial cultures compared with infected soil. Ohio.

Soy bean inoculation tests to determine the need of inoculating soy beans on different soils of the State. Iowa.

Investigation of associated growth of soy beans and corn. Wis.

Plant introduction.

Plant introduction. Tex.

Plant introduction work. Fla.

Plant introduction (Cont.).

Seed and plant distribution. --To encourage more general and more diversified plantings, provide good seeds and plants which can not be obtained elsewhere on the island. Guam.

Test of new and imported species of plants: Acclimatization tests including teff grass, Kikuyu grass, Sudan grass, teosinte, pearl millet, etc. Ga.

Plant nutrition. (See also Fertilizers, and ^{Field} ~~Food~~ Crops - Fertilizer experiments with specific crops.)

Translocation of foods in plants. N.Y. Cornell.

The translocation of the mineral matter in plants. Ky.

Microscopical and chemical study of proximate constituents of plants, their metabolism, and translocation, with special reference to influence of plant food ingredients. R.I.

Study of the relation of the concentration of nutrient solutions to the growth of the barley plant in sand and water cultures. The relation of solution to absorption and forms of combination of important elements. Calif.

Absorption of solutes by plants, with special reference to balanced solutions. Mich.

Study by means of water and pot culture, of the physiological effect and relationship of nutrient elements upon plant growth. R.I.

The relation of noncolloidal solid substrata to certain properties of nutrient media for the growth of plants. N.J.

Investigation of the food requirements of plants growing in sand or in soil cultures. Md.

The relative ability of different crops to obtain their nutrient needs. R.I.

The relation of soil moisture and of the moisture content of sand cultures to balanced fertilizer rations and to the physiological value of nutrient mixtures for plants. N.J.

The salt requirements of representative agricultural plants. N.J.

Effect of the diffusion of carbohydrates on the growth of plants. N.Y. Cornell.

Study of plants in relation to their comparative requirements for lime and magnesia and physiological or other reasons for variation therein. R.I.

Plant nutrition (Cont.).

Functions of nitrogen, potash, and phosphoric acid in the production of the peach. Del.

Nutrition of plants as affected by nitrogen and sulphur and by salts. Calif.

Magnesium and sulphur nutrition of plants. Ark.

The relation of sulphur and sulphur compounds to cell structure. Md.

The influence of form and amount of sulphur on growth and development of seed and of sulphur-loving plants. Wis.

Function of sulphur as a plant food. Wash.

Sulphur requirements of soils and crops. Ohio.

Sulphur fertilizer studies. Oreg.

Status of silicon and need of silicon for plant growth. Wis.

Status and functions of Chlorin in plants. Wis.

Nutrition of orchard and small fruits in relation to resistance to disease. Missouri.

Effects of deficiencies in nutrition upon the physiological functions of crop plants. Mich.

Studies of plant nutrition with reference to physiological diseases. Fla.

Nutrient solutions. Ala.

Poisonous plants. (See also Veterinary Medicine and Chemistry.)

Poisonous plant investigations. Oreg.

Microscopy of poisonous plants. Colo.

Poisonous range plants. Nev.

Botanical and economic study of poison range plants. Ariz.

Reseeding of tall larkspur. Colo.

Whorled milkweed control. Colo.

Miscellaneous.

Study with peaches on change of permeability and its relation to availability; to determine the influence of physical - physiological factors governing the permeability of plant membranes on the availability of compounds. Del.

Botany, miscellaneous (Cont.).

Resistance encountered by the flow of sap in wood of fruit trees.
N.Y. Cornell.

Comparative study of cytoplasmic structures. N.Y. Cornell.

A study of correlations between certain physical characters of plants
and their capacity for yield. S.Dak.

Nitrogen fixation in green algae. N.Y. Cornell.

Metabolism studies with sweet corn. Md.

The controlling influence of carbon dioxide on metabolism in storage
organs. Md.

The effect of fertilizer treatment on composition of the crop, with
particular reference to the effect of concentration and the rate at
which the fertilizer is supplied. P.R.

A study of the effect of fertilizers on the formation of carbohydrates
in plants. Ill.

The relation of hydrogen-ion concentration to plant growth. N.J.

Relation of parasitic fungi and bacteria to their host plants. Va.

Variation of fungi as a result of environment. Maine.

Water requirements of crops as related to plant characters and environ-
mental factors. Nebr.

Chemical and physical behavior of potatoes in the ground after death
of vines. Md.

Variation of plants by growing them for successive generations in soil
treated with large amounts of plant food. Md.

Occurrence and distribution of manganese in plants. Ky.

The effect of digestive fluids on spore viability. The determination
of the question whether or not spore of fungi (smuts, etc.) will
survive passage through the alimentary canal. Vt.

Study of optimum condition of light for plant response. Mass.

Enzymatic activity as a limiting factor in production. Del.

Reactions of enzymes to solutions within the plant. Del.

A study of tolerance of forest trees. Vt.

Botany, miscellaneous (Cont.).

A study of the changes in plant structure due to eccentric growth;
the determination of tree temperatures. Vt.

A study of the factors influencing seed formation in citrus fruits.
Calif.

Cause and prevention of hardness and hardshell in beans. N.Y. State.

Dormant period of trees. Missouri.

Use of anesthetics to break the rest period of plants; use of
anesthetics as a factor in the propagation of plants; use of
anesthetics as a sterilizing agent. N.Y. Cornell.

Drought troubles. Oreg.

Physiological investigations with drought resistant plants. Kans.

Survey of the flora of the Cayuga Basin from the standpoint of classi-
fication, distribution, and soil relations. N.Y. Cornell.

Determination of a temperature law in crop production. Tenn.

Native vegetation as an indicator of crop possibilities. Colo.

The tolerance of plants to acid conditions. Del.

BACTERIOLOGY.

(See also Soils, Dairy Products, and Field Crops- Legumes).

Miscellaneous.

Miscellaneous analyses.--Bacteriological. Wash.

Investigations on foodstuffs. Mich.

Investigations on drinking water supplies. Mich.

Studies on the classification and nomenclature of bacteria. N.Y. State.

Studies of methods of analysis useful in describing pure culture of
bacteria. N.Y. State.

Comparative analytical study of bacterial counts. N.Y. State.

Studies of various fermentations. Mich.

Studies of pentose fermenting bacteria. Wis.

Microorganisms in the fermentation of silage. Iowa.

Bacteriology, miscellaneous (Cont.).

Studies on Bacillus solanacearum causing wilt of tobacco, tomato, and other plants. N.C.

Relation of parasitic fungi and bacteria to their host plants. Va.

Fungus studies. Colo.

The effect of pressure in enzymes. W.Va.

GENETICS.

For improvement of crops and animals for specific purposes, see also Breeding, under different classes of crops and animals.

Miscellaneous

Plastid inheritance. N.Y. Cornell.

Normal growth and post embryonic development. Maine.

Investigation of the laws of inheritance in hybridization. N.Y. Cornell.

Experimental modification of the hereditary process. Maine.

Investigations in Mendelian inheritance in domestic animals. Missouri.

Studies in heredity; causes of sterility in domestic animals; the morphology and physiology of spermatozoa. Ky.

Cytological studies of the reproductive cells of cattle and sheep with some similar studies on the mule. Idaho.

Mendelian work to determine the possibility of fixing certain factors or characteristics and intensifying them. N.C.

The identity of chromosomes in nuclear divisions. N.Y. Cornell.

Determination of independence or coupling in unit characters of a mammal. Ill.

Analysis of cellular structure of hybrids. Maine.

Study of the correlation of characters and of inheritance in pure lines and varieties. Mont.

The effects of continued inbreeding. Wis.

Breeding for hardiness. Minn.

Methods in selection breeding. Colo.

Genetics, miscellaneous (Cont.).

Inheritance of quantitative characters. Calif.

Inheritance of contrasted characters. Miss.

The plant breeding value of mutation and other types of variation in wild and cultivated plants. N.Y. Cornell.

Genetics of Crepis virens, the smooth hawksbeard. Calif.

Intensive study of nature and inheritance of chemical constituents of certain vegetable oils. Wis.

The principles of heredity in certain plants. Calif.

The origin, nature, and inheritance of apparent mutations in certain plants. Calif.

Investigation of inheritance of disease-resistance in plants. Wis.

Inheritance study in cereals. Wash.

Inheritance studies with small grains. Minn.

Correlation of characters in grain. Colo.

Inheritance of barrenness in corn. S.C.

The inheritance and effect of sucker production in corn. Ind.

Xenia in maize and hereditary transmission of various characters. Conn. State

Fundamental study of inheritance in cotton. Tex.

A study of inheritance of Blackhull White kafir. Okla.

A study of the problems of inheritance of character in tobacco. Calif.

Sterility of hybrids of Nicotiana. Penn.

Breeding experiments with bulbous plants. Calif.

The principles of heredity in certain plants. Calif.

Inheritance of fruit characters. Minn.

Nature and inheritance of chemical constituents of certain vegetable oils. Wis.

Genetics, miscellaneous (Cont.).

A study in inheritance in breeding tree, vine, and small fruits.
N.Y. State.

A study of the chromosome number in the reduction division in the female parent cell of the peach and apple, and also of the vascular system of the same fruits from the standpoint of the dependence of flesh formation on seed development and the stimulus which must be transmitted through the vascular system from the developing embryos. Ill.

Genetics, miscellaneous (Cont.).

Principles relating to transmission of characters in the apple as affected by selection and by crossing. Ill.

Xenia in apples. Ark.

Study of certain factors in heredity of the peach. Del.

Cross breeding peaches with reference to improved fruits, improved rootstocks, and study of inheritance in *Amygdalus*. Calif.

Study in the origin of species or the development and improvement by hybridization in the genera *Viola* and *Rubus*. Vt.

Mendelism in the hybrids of blackberries and raspberries, particularly with reference to leaf structure and habits of growth. Wash.

Transmissibility and degree of permanence of vegetative variations of the vine. Calif.

Hereditary studies of *Vitis rotundifolia*. Ga.

Inheritance of alkaloidal content and other characters in *Datura*. Wis.

Inheritance of flower color. Penn.

Inheritance of stringiness (fiber cells) in green podded beans. Wis.

Study of certain factors in heredity of cabbage. Del.

A study of inheritance in the tomato. Penn.

Studies of heredity in vegetables, especially tomatoes and squashes. N.H.

Skunk breeding. Ill.

Experiments with guinea pigs and other small mammals. Wis.

Studies of inheritance in Orthoptera. Kans.

The effect of temperature and moisture conditions on inheritance in Orthoptera. Kans.

Effects of in-and-in breeding of dairy cattle and swine. Del.

Experimental analysis of the heredity factors determining milk and meat production in cattle. Wis.

Establishing a breed of sheep for winter lambing and a study of inheritance of characters. Okla.

A study of the inheritance of wool production. Ohio.

Genetics, miscellaneous (Cont.).

Inheritance investigations in swine. Kans.

Transmission of syndactylism in swine. Ill.

Study of laws governing the breeding of domestic birds. R.I.

Influence of sire and dam in the transmission of egg laying qualities.
Oreg.

Inheritance of high egg production. Oreg.

Study of inheritance of ability for egg production, together with the
development of high fecundity lines through line breeding. N.J.

A determination of the mode of inheritance of various characters of
poultry and a study of various characters of poultry and a study of
other factors governing form and function. Breeding for increased
egg production; the relation between the primary sexual organs
(testes and ovary) and the remainder of the organism; study of the
hatching quality of eggs from the statistical and genetic stand-
point. Mass.

Study of inheritance in pigeons. Wis.

SOILS.

General soil studies.

Soils. Tex.

Soil culture. Okla.

Field soil studies. Mont.

Soil experiment fields. Ky.

Miscellaneous work with soils. Wash.

Field experiment on Volusia soil. Penn.

Systematic study of Michigan's soils. Mich.

Field experiment on Westmoreland soil. Penn.

Acidity, soil reaction, liming. (See also Fertilizers.)

Soil acidity. R.I.

Study of the nature and intensity of soil acidity. W.Va.

Effects of drainage and soil moisture upon soil acidity. Ind.

Acidity, soil reaction, liming (Cont.).

- The nature of so-called soil acidity in Vermont soils. Vt.
- A study of the soluble manganese as one cause of the toxicity of acid soils and means of decreasing its injury to crop plants. Ala.
- Effect of soil acidity on bacteria associated with the nitrogen cycle. Wis.
- The soil acidity relations of soil, plants, and bacteria. Wis.
- Soil constituents attacked by acidity resulting from sulfofication and nitrification processes. Ohio.
- Phosphorus and soil acidity relations of soils and plants. Wis.
- A study of the effect of carbon dioxid gas upon soil reaction. Ind.
- Soil acidity tests and lime trials. Oreg.
- Different amounts of limestone on very acid soil. Penn.
- Lime requirements of an acid soil. Md.
- Lime absorption and acidity. Mass.
- Effects of acid phosphate, raw rock phosphate, limestone, organic matter, and other soil treatments upon soil acidity. Ind.
- Effect of fertilization on lime requirement of soil; comparison of limestone of different grades of fineness; study of methods for determining lime requirements of soils; study of factors contributing to soil acidity. Ohio.
- Study of acid soils in Arkansas.--Greenhouse experiment with lime; using alfalfa on soils from various counties. Ark.
- Lime requirement on Thompson farm. Penn.
- The liming of Oregon soils. Oreg.
- Study of the fertilizer and lime requirements of Rutherford County soils. Tenn.
- The effect of lime on muck and peat soils, organic nitrogenous compounds of peat soils. Mich.
- A study of the effect of lime and organic matter on the impervious Kirkland upland soil. Okla.
- Liming experiments. Miss.
- Changes produced by liming the soil. Ohio.

Soils, Alkali

Action of soil alkali. Utah.

Toxicity of alkali salts to crops. Oreg.

A chemical, biological, and physiological study of alkali in soils in its relation with crop production. Calif.

Alkali and plant food under irrigation and drainage conditions. N. Mex.

Modification of tolerance for alkali by concomitant soil conditions. Ariz.

Tolerance of various crops and trees for alkali salts. Idaho.

Reclamation of alkaline lands by flooding and the drainage investigations. Calif.

Reclamation of alkali land by flooding and tile. Calif.

Reclamation of alkali land at the University farm. Ariz.

Composition of soils.

The effects of exhaustive cropping on the chemical composition of the soil. Ind.

A comparison of the total calcium content of cultivated and virgin soils, with particular reference to the possible limitation of crop production by deficiency of this element. Ky.

Nitrogen assimilation. (See Botany)

Nitrogen fixation.

Nitrogen fixation in green algæ. N.Y. Cornell.

Studies on nitrogen fixation. Calif.

Fixation of nitrogen in Colorado soils. Colo.

Fixation of nitrogen by, and nitrification of, legumes. Calif.

Bacteriological study of alkali soils in relation to nitrogen fixation. Colo.

Nitrogen transformation.

Ammonification and nitrification studies. Utah.

The conditions affecting the physiology of the process of nitrification. Ohio.

Soils, Nitrogen transformation (Cont.).

Relation between sulfofication, nitrification, and ammonification on acid and basic soils. Ohio.

A study of ammonification and nitrification in the soils of southern California, with special reference to the fertilizer plats of the Citrus Experiment Station. Calif.

Organic matter in soils.

Humus investigation. Tenn.

Humus investigations.--The composition and decomposition of organic matter in the soils. Various humus-forming materials are studied. Iowa.

The organic constituents of soils. Nebr.

The quantitative relations of organic matter in soils. Ark.

Effect of lime on the decomposition of organic matter in soils. Del.

Maintenance of organic matter.--To determine the most practicable means of maintaining and increasing the organic content of Oregon soils. Oreg.

Relation of organic matter (humus) of the soil under different systems of soil management to crop production, with special reference to the changes which take place in the plant food content and the physical condition of the soil. Iowa.

Residual effect of crops. (See also rotations.)

Experiment to determine the effects upon tobacco following after cowpeas. To show whether by making proper allowance in fertilizing tobacco, for the ammonia supplied by the legume, it is possible to produce a tobacco of high quality. N.C.

Crop relations, comparative effect of tobacco and other crops on yields of succeeding crops. Md.

The effect of cowpea land handled in various ways, on the growth of wheat following. To determine the effect of growing cowpeas and handling them in various ways preceding a wheat crop as compared with land receiving no cowpeas in the effect on the yield and character of the wheat. Missouri.

The effect of the cowpea crop on soil fertility with special regards to a wheat crop and a corn crop following. A study of the nitrogen content of the soils is included. Tenn.

The comparative after-effects of various legumes and of grass as shown by succeeding corn crops. Tenn.

Residual effect of crops (Cont.).

Extent and nature of influence exerted upon plants by previous growth of other kinds of plants. R.I.

To determine the effect on yield of corn following alfalfa. Ia.

Crop residue work in jars. Wash.

Soil erosion and leaching.

Investigations on the loss of plant food by drainage and erosion. Ohio.

Soil erosion in Iowa. The occurrence and methods of preventing and reclaiming eroded land. Iowa.

Investigation of water penetration, evaporation, run-off, and erosion in the case of an average Missouri soil. Missouri.

Soil fertility. (See also Field crops - Rotations.)

Fertility plats. W.Va.

Soil fertility investigations. Kans.

Soil fertility investigations in western Washington. Wash.

A survey of the potential fertility of West Virginia soils. W.Va.

Soil fertility studies from the standpoint of the vegetable grower. Md.

Fertility investigations with continuous cropping (corn). The effect of manure and lime. Iowa.

An investigation of the changes in the crop-producing power and the physico-chemico biological properties of the soils long under cultivation. Mich.

Soil correction trials. Oreg.

A study of the underlying factors influencing soil fertility as evidenced by the chemical composition of the soil solution. Calif.

Relation of geology and chemistry of soils to productivity and fertilizer requirements. N.C.

Soil fertility investigations. General investigation of the peculiar characteristics of Hawaiian soils and of their relations to fertility. Hawaii.

A study of soil requirements as to certain constituents, chiefly calcium and sulphur. N.Y. State.

Soil fertility (Cont.).

Sulphur in plants and soils and its significance to permanent soil fertility. Ky.

To determine the effect, if any, of potash salts on the reduction, nitrate formation, and soluble salt content of soils, also their influence on the growth of wheat seedlings in water. Penn.

The relation of sulphur to soil fertility and plant composition. Oreg.

A study of the effect of fertilizers and lime on the physical conditions of the soil. Ohio.

Pot experiments in soil fertility. Effects and inter-reactions of lime, organic matter, and rock phosphates on the soil of the North Vernon experiment field. Ind.

Experiments in soil fertility, including the use of lime, green manure, stable manure, and a study of the effect of nitrogen, potash and phosphoric acid upon the soil. Del.

Fertility investigations on the effect of manure, rock phosphate, and commercial fertilizers on soils on certain State farms. Iowa.

Study of the residual effects upon the soil, and of the utilization by rotation crops, of the commercial fertilizers, manure, and lime. Penn.

The rate of accumulation of nitrogen and carbon in soils under different systems of green manuring and cropping. To determine the effect of different systems of green manuring and cropping upon the accumulation and loss of nitrogen and carbon in the soil. Missouri.

Investigation of the value, nature and duration of the residuary effects of vegetable matter when applied to soils of different texture. Mich.

The soil fertility value of cornstalks plowed under y. left to decay on the surface. Ind.

A detailed study of the effect of the barley plant on the soil solutions. Calif.

The value of clover in fertility maintenance. Ohio.

A study of the nitrogen content of the soils. The effect of the cow-pea crop on soil fertility, with special regards to a wheat crop and a corn crop following. Tenn.

The influence of rotations upon the maintenance of soil fertility. S. Dak.

Soil fertility (Cont.).

Value of a nurse crop. Wash.

A comparison of grain farming with stock farming as regards the maintenance of soil fertility. Ind.

Fertility investigations with two-year crop rotation, including the effect of manure and crop residues; the effect of rock phosphate with manure (live stock system); and the effect of rock phosphate with crop residues (grain system). Iowa.

Fertility investigations with three-year crop rotation, including the effect of manure and crop residue; the effect of rock phosphate with crop residues (grain system); and the effect of rock phosphate with manure (live stock system). Iowa.

Fertility investigations with four-year crop rotation, including the effect of various applications of manure and of crop residues; the effect of rock phosphate, bone meal, acid phosphate, potassium salts, and complete commercial fertilizers with manure (live stock system); the effect of the same fertilizers with crop residues (grain system, no manure); the applications of complete commercial fertilizers broadcasted or applied in the hill; the effect of limestone and airslaked lime. Iowa.

Fertility investigations with five-year crop rotation, including alfalfa; the effect of manure and crop residues; the effect of rock phosphate and acid phosphate with manure (live stock system); the effect of phosphates with crop residues (grain system). Iowa.

Permanent fertility studies (Greenville Nephi). Utah.

Soil flora.

Soil bacteriology investigations. N.C.

Soil flora studies. N.Y. State.

Investigation on the presence, distribution, and constancy of the more common types and species of soil bacteria in soils of different origin. N.J.

Bacteriological studies of North Idaho soils. Idaho.

Azotobacter studies. Ohio.

Some possible sources of energy for Azotobacter. Colo.

Studies of the carbonaceous requirements of Azotobacter. Tenn.

The relation of microorganisms to the decomposition of organic compounds toxic to the growth of higher plants. Ala.

Soil flora (Cont.).

A survey of the fungus flora of greenhouse soils. Ill.

Soil fungi. N.J.

Soil molds. Iowa.

The occurrence and action of molds in soil. Iowa.

Studies on the longevity of B. radiculicola in the soil. Missouri.

Bacterial decomposition of organic matter. Tenn.

The relation between bacterial activity and crop production. Iowa.

Bacterial activity in soil as a function of associative action. Colo.

Bacteriological effect of green manures on a typical Mississippi soil. Miss.

Soil bacteriological investigations.--The transformation and need of sulphur. Iowa.

A study of the influence of the absolute reaction of the soil solution upon the growth and activity of *Azotobacter* in soils. Kans.

Effect of soil acidity on bacteria associated with the nitrogen cycle. Wis.

Factors influencing bacterial activities of the soil. Utah.

Soil bacteriological changes due to different soil treatment. Del.

The modification of soil flora through climatic influences. Calif.

The effects of fertilizing materials on bacterial action. Iowa.

Effect of green manuring on activity of soil microorganisms. Md.

The soil solution and its role in the life of microorganisms. Mich.

Soil biology studies.--Refinement and improvement of the methods of recovery and determination of nitric nitrogen in soils; physiological studies on the source of carbon for nitrification: Nitrification in solution, in sand and in soil cultures ~~and the cultures~~ and the effect of cropping and fertilization in the process. Ohio.

Soil management.

Soil management work.--To ascertain how best to manage farm land in the interior. Alaska.

Soil management studies. Mich.

Soil management (Cont.).

Soil management and improvement. Idaho.

Management of heavy clay soils. Wis.

Management of marsh soils. Wis.

Management of sandy soils. Wis.

A study of soils and fertilizers in relation to plant growth and development. Fla.

Experiments to determine the best systems of soil management for the most important soil types in Missouri, including the need of lime, phosphorus, potash, and nitrogen as well as the return to be secured, the use of green manures, farm manures, in some cases drainage and certain cultural methods. Missouri.

Twenty six years work in the use of fertilizers and manure on corn, wheat, and oats grown continuously on the same land; on the same crops grown in succession and followed by clover and timothy in a 5-year rotation and on the 3-year rotation of potatoes, wheat, and clover. Ohio.

Soil experiments to determine physical and chemical properties of Guam soils or soil conditions; and the ultimate improvement of Guam soils. Guam.

Crop production and soil management in relation to soil type at Imperial Valley Station. Calif.

Conserving the plant food in trucking soils during the winter. Md.

Summer treatment of greenhouse soils. Ohio.

Soil improvement: To build up a new soil from volcanic ash. Alaska.

Soil management and fertilizer investigations.--The upbuilding of fertility of the more important soil types. Md.

A preliminary study of the causes and corrections of persistently unproductive garden soils. Penn.

Restoring pasture and meadow on volcanic ash: To introduce tame grasses and clovers as far as practicable to take the place of native grasses destroyed by ash fall. Alaska.

The infertile soils of Montana. Mont.

The effect of drainage, deep tillage, manure, and lime on "push" soils. Iowa.

Effect of dynamiting field subsoils on crops. Ariz.

Soil management (Cont.).

Utilization of logged-off lands in Idaho. Idaho.

Soil moisture.

Soil moisture investigations. Nebr.

Studies in soil moisture. Calif.

Soil moisture studies. Utah.

A study of the moisture relations of California soils, covering the moisture equivalent, hygroscopic coefficient and related factors. Calif.

Soil moisture constants. Utah.

Movement of water in soils. Minn.

The effect of the initial moisture present on movement of water in soil. Ky.

Evaporation and conservation of soil water. Okla.

Soil moisture investigations as related to problems in dry farming. Wash.

Cooperative tillage and soil moisture studies. Oreg.

Studying concentration of soil solution and measuring forms of soil water. Mich.

The effect of different methods of fertilization upon the retention of moisture by the soil. Ohio.

The relation of soil moisture and of the moisture content of sand cultures to balanced fertilizer rations and to the physiological value of nutrient mixtures for plants. N.J.

To determine the critical soil moisture points of the leading crops and soils of the State. Oreg.

Moisture, soil, and crop relations. Utah.

Relation of soil moisture, structural development, and yield of small grain. Colo.

Soil nitrogen.

The changes in the nitrogen content of the soil under various conditions, such as limed, unlimed, fallow, and with and without green manure crops, etc. Tenn.

Soil nitrogen (Cont.).

Changes in nitrogen content of soils treated with fertilizers and manure. Ohio.

Organic nitrogenous compounds of peat soils, the effect of lime on muck and peat soils. Mich.

The nitrogen supply in semi-arid soils. Wash.

Study of conditions which favor the development and control of nitrates in the soil. Mont.

Nitrate production in a soil as affected by the crop and cultivation: To see whether the crop and cultivation cause any effect on the amount of nitrate nitrogen produced in a soil. Missouri.

Soil phosphorus.

A study of the soil phosphoric acid. N.H.

Fixation of phosphoric acid by soils. Va.

Availability of phosphorus supply of calcareous and noncalcareous soils. Ohio.

Phosphorus and soil acidity relations of soils and plants. Wis.

A study of the phosphorus supply of Ohio soils. Ohio.

Soil physics.

Adsorption in relation to soluble fertilizer salts. Mich.

A study of the hourly and daily fluctuations in the temperature of the soil. Records at different depths under bare and cropped surfaces. Md.

Adsorption in relation to osmosis in soils. Mich.

Soil potash.

The liberation of soil potassium. Penn.

Potassium content in successive strata of different soil types and effects of varying treatments on its availability. Mass.

Studies in possible changes in soil potassium. Ohio.

An investigation of the factors affecting the availability of the potassium compounds of the soil. Md.

The rendering available of potash in insoluble silicates by the action of soil bacteria. Ky.

Soil sterilization.

The effects of heating soils on germination and plant growth and the development of diseases in heated soils which have become reinfested. Wis.

Sterilization of soil with sodium cyanid to destroy insects, parasitic fungi, and weed seed. Calif.

Prevention of lettuce diseases by sterilizing soil with formaldehyde. Mass.

Tomato wilt diseases and soil sterilization of plant beds and greenhouses. Selection of resistant strains of tomato plants. Ohio.

Soil surveys.

Soil survey. Idaho, Ind., Kans., Ky., Ohio, Oreg., Utah.

Soil survey of the State. Ark., Md., N.C., Va.

Soil survey of agronomy experimental plats on the Armstrong ranch, Davis, Calif. Calif.

Soil survey of Brawley area. Calif.

Soil survey of El Centro area. Calif.

Soil survey of Grass Valley area. Calif.

A soil survey of the Los Angeles area. Calif.

Soil survey of Santa Maria area. Calif.

Soil survey of Willits area. Calif.

Detailed soil survey of Iowa.--The preparation of soil maps of each county, showing the location of all soil types, roads, streams, etc., and of a report describing all soil types, giving results of soil analyses, fertility studies on individual types in the greenhouse and field, and recommendations for treatment. Iowa.

Soil types.

Coniferous timber soil investigation. Idaho.

Peat soils. Minn., Ohio.

Organic nitrogenous compounds of peat soils, the effect of lime on muck and peat soils. Mich.

The analysis of clay soils of Ontonagon County. Mich.

Glacial soils of the gray drifts. Minn.

Soil types (Cont.).

Soils of different drift sheets. Minn.

Field and pot tests to determine the fertilizer requirements of Dekalb soils. Penn.

Soil management and fertilizer investigations. The upbuilding of fertility of the more important soil types. Md.

Pot culture studies of the fertilizer requirements of different soil types. Md.

The effect of lime, rock phosphate, acid phosphate, and commercial fertilizers, with manure (live stock system) under common rotations, on seventy fields in various parts of the State on important soil types in surveyed counties, and the effect of the same fertilizing materials with crop residues (grain system) on the same fields. Iowa.

Fertility investigations on Wisconsin drift soils.--The effect of barnyard manure, green manures, bone meal, and potassium salts under a four-year rotation of corn, corn, oats, and clover. Iowa.

A study of the lime, phosphorus, potassium, nitrogen, and organic matter needs of the upland yellowish brown silt loam soil of south-central Indiana, represented on the Moses Fell Annex farm at Bedford, Lawrence County. Ind.

Investigations with fertilizers for muck lands. Mich.

Complete fertility test of a typical Miami silt loam. Ind.

An investigation to determine the plant food content and the acidity of each type of soil in each of the counties of Iowa. Iowa.

The composition and properties of certain soil types and the effects of some plants when grown on them.--To ascertain whether representative samples of a type taken from widely separated places in the State have similar fertilizer needs. On certain types, to determine the nitrogen balance under timothy and alfalfa after these have grown for a number of years. Tests are being made of the effect of incorporating manure in the soil with raw rock and acid phosphates; tests with different forms of lime and with limestone ground to different degrees of fineness. N.Y. Cornell.

The mineral composition of crops grown on different types of Idaho soils. Idaho.

Chemical examination of the principal soil types of the State. Ohio.

Tillage as related to fertility and productivity.

Different methods of preparation and cultivation. Miss.

Tillage as related to fertility and productivity (Cont.).

Cooperative tillage and soil moisture studies. Oreg.

Influence of methods of surface treatment of soil on yields. Calif.

A study of the effect of stirring soil on moisture content, oxidation, nitrification, and crop yield. S.C.

A comparison of very deep (15 in.) with normal plowing (7 1/2 in.) and both with normal plowing plus subsoiling - rooting to the depth of 6 in. in the bottom of furrow. Ohio.

A rotation for the comparisons of depth of tillage, including plowing to 4 and 7 in., plowing, subsoiling, and plowing with a deep tilling machine to a depth of 12 in. S.Dak.

A test of deep and shallow plowing at Strongsville test farm. Ohio.

Miscellaneous soil studies.

Soil technology studies, including a study of the composition and concentration of soil water under different methods of soil treatment; influence of soil moisture and temperature on the availability and utilization of plant nutrients in the soil; and investigations on the conditions under which lime is removed from the soil and of the changes which accompany it. N.Y. Cornell.

The immediate and residuary effects of soluble salt on the physical and chemical properties of soils. Mich.

Soil studies, especially regarding conditions and properties of phosphoric acid, potash and humus, and the nitrifying and other biological properties of soil. Tex.

Solubility effect of ammonium sulphate on the soil. Mass.

Translocation of soluble salts in soils and its relation to amount and manner of application. Mich.

Influence of lime and magnesia on conservation of soil sulphur. Tenn.

The effect of straw on the soil. Wash.

Evaporation and weather studies in relation to soil production. Oreg.

Tile cylinder investigations. N.Y. State.

Lysimeter studies. Mich.

Lysimeter investigations. N.Y. State.

FERTILIZERS.

See also Soil Fertility and Botany-Plant nutrition.

Fertilizer experiments, general. (See also Field crops, specific crops and Rotations)

General comparative fertilizer tests at the Pee Dee Station. S.C.

General comparative fertilizer tests at the Coast Station. S.C.

General comparative fertilizer tests. S.C.

Experiments with different carriers of phosphoric acid, potash, and nitrogen as sources of plant food.--To determine the relative values of different sources as carriers of these constituents for growth of different crops on leading types of soil. N.C.

Fertilizer investigations, including (a) a comparison of equal money values of phosphorus alone, of phosphorus and potassium and of nitrogen, phosphorus, and potassium; (b) a comparison of equal money values of acid phosphate and floats; (c) acid phosphate and kainit used together in connection with manure; (d) a test to determine what crops of the rotation should be fertilized for best results; (e) what crops should receive the manure products of the farm; (f) what proportion of nitrogen phosphorus and potassium are most profitable; (g) a comparison of the newer carriers of nitrogen, phosphorus, and potassium as to which are most profitable; (h) a comparison of commercial fertilizers with manure as carriers of nitrogen, phosphorus, and potassium; (i) the application of lime at different times during the rotation; (j) coarse limestone compared with fine; (k) magnesian limestone compared with nonmagnesian limestone; (l) magnesian lime compared with nonmagnesian lime; (m) varying amounts of limestone per acre. Ohio.

A study of the chemical and physical effects of nitrate of soda on citrus soils. Calif.

Experiments to determine the value of bat guano as a fertilizer. Missouri.

Liming and fertilizer experiments, including a comparison of different phosphates. Tenn.

Nitrogen economy in cane soils.--To determine the comparative utility of nitrate of soda, sulphate of ammonia, and leguminous manures as sources of nitrogen for cane fertilization. P.R.

Availability of different sources of fertilizer elements. R.I.

Fertilizer application experiment. Va.

Study of methods of applying fertilizers.--To determine relative value of broadcast v. drill applications of fertilizers for corn and cotton added in normal amounts. N.C.

Fertilizer experiments, general (Cont.).

A study of the effect of the continued use of fertilizers containing single and different combinations of plant food elements. Also the effect of lime added to each fertilizer under comparison. Mass.

Soil test experiment to show what ingredients are most beneficial for each crop and the relative amounts of each ingredient necessary for a balanced fertilizer. Maine.

Best proportion of plant food constituents for corn, small grains, and cotton, grown on different soils in average conditions.--To determine by field experiments and chemical analysis, the best proportions of the different plant food constituents required by different soils for the best paying returns. N.C.

The effect of fertilizer treatment on composition of the crop, with particular reference to the effect of concentration and the rate at which the fertilizer is supplied. P.R.

Experiment on use of manures, commercial fertilizers, and green crops for maintaining soil fertility in vegetable gardens. N.H.

Commercial fertilizers on greenhouse soils. Ohio.

Fertilizer experiments. Minn., N.Dak.

Fertilizer experiments on the chief soil types of the State. Oreg.

Field experiments with fertilizers and manure. Ohio.

Fertilization test. Nebr.

Fertilization experiments in 6 series of field plats. N.Y. State.

Special studies in the fertilization of soils by means of pot cultures. Ohio.

Experiments with commercial fertilizers. Miss.

Fertilizer experiments at University Farm. Calif.

Field experiments in the use of fertilizers and manures. Ohio.

A critical and statistical study of long-time fertilizer experiment. The Ohio and Pennsylvania experiments. Calif.

Fertilizer rotation experiment. Va.

Fertilizer and rotation experiment. Ark.

Use of fertilizers in Oregon. Oreg.

Fertilizer experiments, general (Cont.).

Cooperative fertilizer tests. Nebr.

Cooperative fertilizer tests with farmers. Ark.

Green manures.

Effect of green manuring on the soil. Va.

Bacteriological effect of green manures on a typical Mississippi soil. Miss.

Effect of green manuring on activity of soil microorganisms. Md.

Loss of nitrogen from clover incorporated with and spread on surface of soil. Ohio.

Trials with various legumes for green dressing purposes.--To find a legume resistant to caterpillar and fungus attacks which will be suitable for green dressing purposes. Virgin Islands.

A comparison of various kinds of green manure crops for supplying nitrogen to the soil. Del.

The determination of the green manure and cover crops best adapted to local conditions and the ultimate improvement of Guam soils. Guam.

Green manuring experiments, including cowpeas, soy beans, and buckwheat. Md.

Green manuring experiments, including crimson clover, hairy vetch, rye, red clover, and alsike clover. Md.

A comparison of the value of green manures, barnyard manures, and summer fallow, using sweet clover and rye as green manures. Wyo.

Green manures and peat as sources of organic matter. R.I.

Organic manures. Oreg.

Lime. (See also Soils, Acidity.)

Lime experiments. Va.

Field tests with lime to ascertain beneficial effects of liming, especially on the poorly drained bottom land. Alaska.

A study of the effect of various forms of lime. Del.

A field comparison of various forms of lime, also rate-of-liming experiments. Tenn.

Calcium v. magnesium limestone. Md.

Lime (Cont.).

Limestone studies. Oreg.

Analysis of the agricultural limestone of the State. Ky.

Nature and distribution of limestone in Arkansas. Ark.

Decomposition of calcium and magnesium carbonates in soils under field conditions, including drainage investigations. Tenn.

Fate of the coarse limestone particles on plat 32 of the general fertilizer experiment. Penn.

Downward progress of lime applied as top dressing. Penn.

Manure.

A comparison of the value of barnyard manures, green manures, and summer fallow, using sweet clover and rye as green manures. Wyo.

A study of the best place in the rotation to apply manure. Ind.

Experiments to determine the best place for the application of farm-yard manure in a standard five-year crop rotation. Tenn.

Studies on the ammonification of manure. N.Y. State.

The decomposition of manure. N.Y. State.

Changes in nitrogen content of manure. N.Y. State.

Nitrogen studies.--Effect of reinforcing materials on availability and conservation of nitrogen in manure. Ohio.

Effect of weathering and storage upon the composition of barnyard manure. Missouri.

Efficiency in manure handling and preservation. Oreg.

Nitrogen.

Nitrogen fertilizer experiments. Oreg.

Availability of nitrogenous fertilizer materials. N.J.

A study of the influence of applications of sulphate of ammonia and nitrate of soda on both the soil and the crop. Ga.

Determination of the relative values in crop production as sources of nitrogen, of barnyard manure, nitrate of soda, sulphate of ammonia and dried blood. Mass.

Nitrogen (Cont.).

Comparative tests of nitrogenous fertilizers at the Pee Dee Station.
S.C.

Comparative tests of nitrogenous fertilizers at the Coast Station.
S.C.

Comparative tests of nitrogenous fertilizers at Clemson College.
S.C.

Pot experiments in soil fertility.--The availability of nitrogen in
muck as compared with other carriers of nitrogen as fertilizer.
Ind.

Phosphorus.

Phosphorus fertilizer studies. Oreg.

Phosphorus fertilizer tests. Mont.

A study of the efficiency of different carriers of phosphoric acid.
Del.

A field test of different carriers of phosphorus. Penn.

Crop rotation and fertilization studies.--A comparative study of
different phosphates used as fertilizer. Ind.

Comparative tests of phosphate fertilizers. S.C.

Liming and fertilizer experiments, including a comparison of differ-
ent phosphates. Tenn.

Determination of the relative values of different forms of phosphorus
upon the soil at Columbia to determine the availability, the value
and the effect upon both soil and crop of the phosphorus as supplied
in a number of phosphorus carriers. Missouri.

A comparison of bone meal, basic slag, acid phosphate, and raw rock
phosphate as fertilizers. Ind.

Raw rock phosphate v. acid phosphate in a three-year rotation. La.

Phosphate experiments to compare the availability of the phosphorus
in raw ground phosphate rock with acid phosphate, when used with
green manures. Md.

A study of the availabilities of raw phosphates compared with acid
phosphates made insoluble with lime and with ferric-aluminum salts,
checked against no phosphorus and acid phosphate untreated. Ga.

An attempt to determine the reason for the superiority of limestone
and acid phosphate over limestone and rock phosphate in crop
production on certain types of soil. Ky.

Phosphorus (Cont.).

- The comparison of acid phosphate and manure, and rock phosphate and manure with and without lime. S.Dak.
- Relative value of different amounts of phosphoric acid on Dekalb soils. Penn.
- The relative efficiency of several large sized initial applications of raw rock phosphate. Ind.
- The relative availability of phosphate rock (floats) in different degrees of fineness. Penn.
- Experiments with barium phosphate.--A new tri-basic barium phosphate derived from apatite. Maine.
- Barium phosphate experiment. N.J.
- Field experiments with barium phosphate as a fertilizer. N.Y. State.
- Influence of various silicates on crop growth and utilization of phosphates. Ohio.
- Availability of phosphorus compounds for crop use.--To find the difference in availability of different phosphates in the soil to crops and methods of making those compounds more available. Oreg.
- Availability of rock phosphate in acid soils. Ark.
- Composting raw phosphate rock and sulphur with different soils. Tex.
- Solubility of phosphorus produced by combined effects of sulfofication and nitrification. Ohio.
- Laboratory and greenhouse investigations with soil, phosphate, sulphur composts; and with changes in nitrogen content of manure. N.Y. State.
- Sulphur oxidation [as a means of rendering phosphates available]. N.J.
- A study to determine the influence of composting commercial organic ammoniates, ground phosphate rock and rich soil, on the availability of the phosphorus content of the ground rock and on the loss of ammonia content of the organic ammoniates. Ga.
- Composting floats with soil and manure. Ohio.

Potash.

Potash experiments. Oreg.

Study of the value of various potash fertilizer materials. Ind.

Potash (Cont.).

To determine the relative value of seven different potash salts: Kainit, high-grade sulphate of potash, low-grade sulphate of potash, muriate of potash, nitrate of potash, carbonate of potash. Mass.

Comparison of sulphate of potash (high-grade) with muriate of potash for various crops. Mass.

Availability of potash in greensand marl. N.J.

Effects of impure potash salts on germination and subsequent growth of plants. Va.

A study of the effect of Trona potash on cotton and corn. S.C.

[Borax in potash salts]. Ind.

To determine the effect, if any, of potash salts on the reaction, nitrate formation, and soluble salt content of soils, also their influence on the growth of wheat seedlings in water. Penn.

Sodium as a substitute for potassium. R.I.

Sulphur. (See also Botany-Plant nutrition.)

Function of sulphur as a plant food. Wash.

Sulphur requirements of soils and crops. Ohio.

The relation of sulphur to soil fertility and plant composition. Oreg.

Sulphur in plants and soils and its significance to permanent soil fertility. Ky.

A study of soil requirements as to certain constituents, chiefly calcium and sulphur. N.Y. State.

Sulphur fertilizer studies. Oreg.

Miscellaneous.

A study to determine what part colloidal matter plays in the efficiency of commercial fertilizers. Ga.

FIELD CROPS

General.

Methods of harvesting test plats.--To study the accuracy of records secured by harvesting a portion of a plat in comparison with the yields secured from the entire plat. Md.

Field Crops, general (Cont.).

General agronomic, fertilizer, cultural, and variety tests of edible root crops to determine the best combinations of fertilizers, the best cultural methods, and the best varieties. Hawaii.

General field crop production experiments and tests. Ky.

General agronomic, breeding, selection, and variety tests of field and forage crops to develop better strains. Comparative tests to indicate the most promising of the introduced and developed varieties. Hawaii.

Agronomical plant collection. Calif.

Miscellaneous agronomy experiments, covering peanuts, sorghums, legumes, kafir, and cowpeas. Rate and date of planting. Okla.

A test of 20 different crops and crop combinations used as catch crops at last cultivations or after corn harvest. Ohio.

Crop production studies. Tex.

High altitude crops. Colo.

Miscellaneous plantings at Imperial Valley Experiment Station. Calif.

Cooperative crop experiments on farmers' lands. Ariz.

Cooperative experiments with farmers, including corn, small grains and forage crops. Ark.

Field visitation: Encouragement of crop diversification, assistance in marketing of seeds, development of seed growers' associations. Idaho.

Crop survey of the Russian River Valley, Russian River drainage basin in Mendocino and Sonoma Counties. Calif.

Root crop investigations, to learn best varieties and cultural methods for yautias, dasheens, and sweet potatoes for Porto Rico. P.R.

Fertilizer, crop rotation, variety studies, and cultural experiments with particular crops at eight county experiment stations. Va.

Alfalfa.

A test of the different species and varieties of alfalfa. Penn.

A comparison of varieties and strains of alfalfa for hardiness and yield. Iowa.

A test of 15 varieties and regional strains of alfalfa. Ohio.

Alfalfa (Cont.).

Alfalfa variety test to compare some of the more common varieties of alfalfa now found on the market with native-grown alfalfa, and to ascertain if any of these much-talked-of strains are better suited to the irrigated valleys than those now being grown. N.Mex.

Alfalfa tests (varieties) Mont.

Alfalfa variety tests to find hardy alfalfas for pasture and hay. Alaska.

Alfalfa experiments (adaptability). Va.

Development of strains of alfalfa and sweet clover with a minimum per cent of hard seed. Wyo.

Development of strains of alfalfa for ^{maximum}~~minimum~~ hardiness and yield. Wyo.

Breeding of hardy alfalfas in attempting to secure strains which will produce seed under Iowa conditions. Iowa.

Breeding alfalfa with reference to the extreme subtropical conditions of Arizona. Ariz.

Plant-to-row tests of selected strains of alfalfa. Ohio.

Work on the introduction and improvement of alfalfa. S.Dak.

Alfalfa in West Virginia. W.Va.

Alfalfa with a nurse crop. Ala.

Investigation of crop failures following alfalfa. N.J.

The yellowing and dying of alfalfa in July and August. Md.

Alfalfa investigations, including rate of seeding, time of seeding, comparison of various nurse crops and methods of seeding, effect of late and frequent cuttings, effect of a mixture of sweet clover with alfalfa on yields and stand, and factors causing yellowing of alfalfa. Wis.

A survey of alfalfa growing in the State. Tabulating results secured by Iowa farmers comparing results secured on different soils from different times of seeding, rates of seeding, time of cutting, etc. Iowa.

Culture methods for alfalfa when used for pastures or for hay production. Calif.

Different methods of cultivation of alfalfa. Iowa.

Alfalfa (Cont.).

Methods of seeding alfalfa. Iowa.

A comparison of different methods of distributing alfalfa seed.
Ohio.

Winter v. spring seeding of alfalfa, sweet clover, and red clover.
Ind.

Methods of reseeding alfalfa. Iowa.

Different rates of seeding alfalfa, ranging from 5 to 25 lbs. per
acre. Ohio.

Rate of seeding alfalfa as influencing freedom from weeds and
yield. Iowa.

Experiments in growing alfalfa and varieties of small grains. Conn.
Storrs.

A test of the use of dynamite in preparing ground for alfalfa. Ohio.

The value of disking and manuring in cleaning and renewing old
alfalfa fields. Ohio.

To secure the best method of growing and handling and especially the
effect of drainage on the life of alfalfa; secondarily to determine
the effect on yield of corn following the crop. La.

Duty and effect of duty of water on alfalfa. N.Mex.

Vegetation house studies with alfalfa to be used as a check on the
irrigation work under field conditions. Utah.

Duty of water for alfalfa and disposition of irrigation water in
Imperial Valley alfalfa fields near El Centro. Calif.

Alfalfa fertilizer test. Ala.

A study of the lime and fertilizer requirements of alfalfa. Ind.

Alfalfa: A comparison of the influence on yield of inoculating and
of using lime on the different soils of the State. Iowa.

Effect of more common fertilizers on yield and of inoculation by pure
cultures on alfalfa under irrigation. N.Mex.

The effect of scarifying alfalfa and clover seed with the Ames
scarifier. Ohio.

Hard seed of alfalfa. Colo.

The comparative value of seed testing different weights per bushel,
with alfalfa and clover. Ohio.

Alfalfa (Cont.).

Testing out of source of alfalfa seed. N.J.

Source of alfalfa seed as affecting yield and hardiness to winter killing. Iowa.

Alfalfa seed growing, to establish varieties of hardy alfalfas by the use of Alaska grown seed. Alaska.

Source of alfalfa seed with reference to hardiness. Wyo.

Studies of the effects of cutting alfalfa hay at different stages of growth. Kans.

Methods of curing alfalfa hay. Iowa.

Barley.

A comparison of commercial varieties of barley. Iowa.

Variety testing and head selection of barley for yield and early maturity. Wyo.

Barley variety tests, to learn which varieties will mature and prove useful. Alaska.

A study of the adaptation of the important varieties of spring barley for Missouri conditions.--To determine the adaptation of different standard varieties of spring barley to the various soil types of the State. Missouri.

Breeding work with barley. S.C.

Study of winter and spring barleys. Ark.

Barley multiplication. Ala.

Barley classification, for the purpose of making a classification of cultivated varieties of barley. N.Y. Cornell.

Barley breeding for strains better adapted to Iowa conditions. Iowa.

Barley breeding to develop earlier and better varieties for growing in Alaska. Alaska.

Barley and oat breeding. Wis.

Winter barley culture. Idaho.

Cultural tests with barley. Ark.

Cultural tests with barley and oats. Nebr.

Date-of-planting experiments with barley, oats, and wheat. Tenn.

Barley (Cont.).

Rate of seeding barley as influencing the yield. Iowa.

Rate and time of seeding barley, wheat, and oats. Wyo.

Study of the relation of the concentration of nutrient solutions to the growth of the barley plant in sand and water cultures. The relation of solution to absorption and forms of combination of important elements. Calif.

Effect of stage of maturity at harvest upon the germination power of barley, wheat, and oats. Wyo.

Investigations to determine causes of spotted growth in barley fields. Calif.

Barley as compared with oats for greatest production of food units. Iowa.

Broom corn.

To compare different types of broom corn for the production of brush, and to determine the best cultural methods for the crop under irrigation. N.Mex.

Buckwheat.

Buckwheat investigations. W.Va.

Variety tests and breeding to secure improved strains of buckwheat. Maine.

Variety tests and methods of seeding buckwheat. W.Va.

Studies in crop cultural methods. The best time to sow buckwheat. Ind.

Cane (sugar).

Cane variety experiments, to increase the quantity of sugar per acre capable of being produced in the Island. Virgin Islands.

Sugar cane variety test to secure a variety that will give a more profitable yield of sugar per acre. La.

Cane breeding experiments to increase the quantity of sugar per acre produced in the Island. Virgin Islands.

Raising of cane varieties of high sugar content and tonnage, resistance to diseases: Suited to the various climatic and soil conditions of the Island. Such varieties to replace present run-down ones. P.R.

Fertilizer experiments with Japanese cane. Fla.

Cane (sugar) (Cont.).

Fertilizer experiments with sugar cane to determine the commercial effect of added plant food. La.

Sugar cane fertilizer experiments. Ala.

Winter cover crops on fall planted cane to utilize the fall, winter, and early spring months to grow an extra leguminous crop in the regular rotation. La.

Cereals.--General.

Variety testing of cereals. Idaho.

Experiments in growing varieties of small grains and alfalfa. Conn. Storrs.

Grain growing on field scale to test barley, oats, wheat (spring and winter), rye, (winter), and buckwheat on a field scale. Including also variety tests. Alaska.

Cereals and forage crop tests. Idaho.

Small grain variety work. N.C.

Grain varieties. Utah.

Variety tests of small grains, including spring wheat, barley, and oats. N.H.

Grain investigations to test many varieties of grain, especially the hybrids produced at Rampart, to ascertain adaptability to the Matanuska Valley. Alaska.

Experiments with varieties and with cultural methods for grain and forage crop production under both dry farming and irrigation at an altitude in excess of 6,000 ft. Idaho.

Variety test of cereals in pure line plats: Selection of varieties and increase of pure line seed of best varieties. N.Mex.

The increase and fixation of desirable properties in cereals. Ohio.

Triangular grain tests. Mont.

Cereal identification and classification nursery. Oreg.

Cereal classification, identification, breeding and disease nursery. Idaho.

Small grain improvement by selection. Ark.

Small grain improvement work. N.C.

Cereals' general (Cont.).

Cereal improvement investigations. Kans.

Investigations in cereal breeding. Minn.

Cereal breeding and variety testing at Brookings and the substations at Eureka, Highmore, Cottonwood, and Vivian. S.Dak.

Rate and date of seeding, methods of seeding and culture, date, and methods of harvesting grain and forage crops and variety tests. Physiological investigations with grains as to causes of winter-killing and sterility and of immunity to certain varieties of wheat to the Hessian fly. Kans.

The drilling of small cereals in rows 4 in. apart as compared with 8 in. Ohio.

Date-of-planting experiments with the small grains, wheat, oats, and barley. Tenn.

Late seeding of winter grain as affecting yield and winterkilling, including winter wheat, winter rye, winter barley, and winter oats. Iowa.

Effect of thickness of stand on cereal plants. Nebr.

Cereal production investigations. Kans.

Winter and spring grains: Culture and management of winter and spring grains, including wheat, oats, barley, and rye. Ariz.

A study to determine at what time in the life of the cereals, potassium must be supplied to produce normal growth. N.H.

Top dressing winter grains. Ga.

The relation of seed treatment to the physiology of grains. Oreg.

Investigations relative to grain quality. Oreg.

Grain mixtures for grain and forage. Mont.

Disease resistance of varieties of small grains. S.C.

Cereal investigations. N.Dak., Va.

Investigation with small grains. Minn.

Relation of soil moisture, structural development, and yield of small grain. Colo.

Clovers, etc. (See also Legumes.)

Clover investigations. Ind.

Clover experiments. N. Dak.

Comparison of the different species and varieties of clover as to yield. Ohio.

Medicago variety tests. Ala.

Red clover breeding. Iowa.

A study of the relation of insects of different kinds to fertilization of red clover. Ohio.

Plant-to-row tests of strains of red clover grown from individual plants. Ohio.

Clovers, species of. Ala.

Native and introduced species of *Trifolium* in the United States. Calif.

Winter y. spring seeding of red clover, alfalfa, and sweet clover. Ind.

The duration of the different clovers when cut for hay only and when allowed to produce seed. Ohio.

A study of red clover failures in an effort to more nearly insure the securing of a "catch". Iowa.

Red clover: A survey of results secured by Iowa farmers comparing different methods of seeding, rates of seeding, curing of hay, etc. Iowa.

Rate of seeding red clover as influencing yield. Iowa.

Methods of seeding red clover. Iowa.

A comparison of methods and times of seeding clover. Ohio.

A comparison of the use of clover for hay with its direct use as a fertilizer in a 3-year rotation of corn, wheat, and clover, and when used as a fertilizer, a further comparison of plowing it under at different times, followed by different treatments. Ohio.

Lespedeza fertilizer experiments. Ala.

The value of clover in fertility maintenance. Ohio.

The comparative value of seed testing different weights per bushel, with clover and alfalfa. Ohio.

Clovers, etc. (Cont.).

The effect of scarifying clover and alfalfa seed with the Ames scarifier. Ohio.

Treatment of bur clover seed: Hulled y. not hulled. Ala.

A study of crimson clover seed. Del.

Red clover y. sweet clover as a legume for pasture purposes. Tenn.

Resistance of red clover to Colletotrichum trifolii. Tenn.

Chemical composition of clover. Mont.

Clover, sweet.

Sweet clover investigations. Okla., Penn.

Development of strains of sweet clover and alfalfa with a minimum per cent of hard seeds. Wyo.

Breeding biennial white sweet clover for resistance to disease and more uniform setting of the seed. Iowa.

The development and distribution of a new species of sweet clover, an annual which gives great promise of unusual value. Iowa.

Winter y. spring seeding of sweet clover, alfalfa, and red clover. Ind.

A survey of sweet clover growing in the State, tabulating results secured by Iowa farmers, comparing results secured on different soils from different times of seeding, rates of seeding, time of cutting, etc. Iowa.

Water as a limiting factor in the growth of sweet clover. S.Dak.

Methods of seeding sweet clover. Iowa.

Rates of seeding sweet clover. Iowa.

Sweet clover: A study of the yield and ease of securing a stand as influenced by inoculation and the use of lime on different soils of the State. Iowa.

Influence of both time and height of cutting of sweet clover on stand and yield. Tenn.

Methods of curing sweet clover hay. Iowa.

Sweet clover y. red clover as a legume for pasture purposes. Tenn.

Value of sweet clover as forage crop for Wisconsin. Wis.

Clover, sweet (Cont.).

Melilotus and black medic for hay. Ala.

Corn.

Variety tests with corn. Ala., Ark., Ga., La., N.C., S.C., W.Va.

Variety tests in corn to secure the variety which is best adapted to local conditions. La.

Work with flint corn.--Variety tests, selection and breeding to secure new and improved strains. Maine.

Varietal experiments with corn for the determination of effect of early planting upon maturity. Idaho.

A test of different varieties and distinct pedigreed strains of corn, in the usual tenth-acre plat test. Ohio.

A study of commercial strains of corn. Ark.

A test of the yielding power of different strains of corn of the same varieties. Iowa.

Silage corn tests: Various varieties representing each of the principal types of corn likely to be grown in New York for either silage or grain. To get the total yield of dry matter for each variety through a series of years, and to get data on the proportion of grains to stover produced by each of the different types. N.Y. Cornell.

Variety tests of ensilage corn. N.H., N.J.

A test of 14 varieties of corn for silage. Ohio.

Comparison of Iowa No. 10 corn with home variety. Iowa.

Comparison of Iowa 203 corn with home variety. Iowa.

Tests of the comparative yield of different varieties of corn. Conn. Storrs.

Cooperative tests of new strains of corn by farmers throughout the State. Iowa.

Corn breeding. Idaho, Ind., Miss., Penn., Wis.

Breeding experiments with corn. Ala.

Corn breeding investigations. Minn.

Corn breeding: Improvement of corn for use on the Island. Virgin Islands.

Corn (Cont.).

Breeding work with Belmont corn. S.C.

Breeding work with Lee County corn. S.C.

Breeding work with Lowman Yellow corn. S.C.

Breeding Reid's Yellow Dent corn at Ames. Iowa.

Breeding Silver King corn near Ackley, Iowa. Iowa.

Degree of close breeding in maize. Nebr.

The hybridization of varieties of corn and use of first generation seed as a practical means of increasing the yield. Iowa.

A correlation experiment in corn breeding to test the relation between percentage of protein in seed and the total amount of protein in the crop. S.Dak.

Selective breeding for the improvement of corn varieties adapted to general farming in Arizona. Ariz.

The crossing of superior ears of corn as determined by previous ear-to-row tests, and the multiplication of pedigreed crosses in isolated plats. Ohio.

The effect of the isolation of superior ears of corn, as determined by testing in pure-line breeding. Ohio.

Crossing improved corn with Hopi maize to produce a variety of acclimatized corn which can be planted deep in the moist subsoil and germinates successfully. Virgin Islands.

Corn improvement, to procure an earlier maturing, lower-growing strain of corn for Guam; to increase the yield and quality, if possible, along with above improvement, of the corn grown here. Guam.

Corn improvement, to increase the yield of corn on the Island. Virgin Islands.

The raising of a strain of corn, which is an improvement on yield, disease resistancy, uniformity of maturing. P.R.

Improvement of dent, flint, and sweet corn in yield and feeding value, by breeding work in 3 different localities- extended to include work with tomatoes, especially the value of first generation hybrids. Conn. State.

Corn improvement, ear-to-row breeding and hybridization. Ark.

To secure a white flint corn that is equal or superior to yellow creole. La.

Corn (Cont.).

Corn: Ear-to-row breeding experiments. Ala.

Selection and breeding work with corn, ear-to-row and remnant method.
Mich.

Breeding corn for drought resistance. Kans.

Corn breeding for the development of high and low eared strains.
S.Dak.

Increasing the productivity of Rhode Island White Cap corn. R.I.

The inheritance and effect of sucker production in corn. Ind.

Inheritance of barrenness in corn. S.C.

A comparison of three corn breeding systems to discover, if possible,
which is best calculated to increase yields. S.Dak.

Corn production, selection, breeding, and variety adaptation. Md.

The testing of individual ears of corn in ear-to-row work. Ohio.

Corn ear-to-row trials. Oreg., W.Va.

The effect of crossing standard varieties of corn, on yield. Ohio.

Types of field corn. N.J.

The relation of prominent visible characters in ear and stalk of corn,
to yield, including shape of ear, length of ear, weight of ear,
number of rows per ear, filling of tip, indentation of kernels,
specific gravity of kernels, height of ear on stalk, height of
plant, angle of ear, proportion of grain to cob, and proportion of
grain to stover. Ohio.

Corn multiplication. Ala.

A study of stalk characteristics as related to yield in corn. Iowa.

The relation of ear characteristics to yield in corn. Iowa.

Ear-to-row test with corn. Ga.

Development of the various parts of the corn plant. Missouri.

The effect of variations in physical characters and chemical com-
position of the corn kernel upon the vigor of the plant. Del.

A study of repeated freezing and thawing of seed corn at controlled
temperatures as influencing the germination. Iowa.

Corn (Cont.).

Principles governing growth and maturity in corn. Va.

The relation of the early development of root, stem, plumule, and culm in the germination box to yield of corn. Ohio.

Phenological observations as related to the time of planting corn. Ind.

Date-of-planting trials with corn and various other crops. Tenn.

The relation of date of planting to yield of corn. Ohio.

Rate-of-planting experiments with both corn and soy beans. Tenn.

Cultivation experiments with corn: Deep, medium, and shallow cultivation-beginning deep and continuing shallow- no cultivation- discontinuing cultivation at various stages. Ark.

Cultural experiments with corn, including the rate of planting, methods of preparing sod land and stubble land, depth of plowing and subsoiling, methods of cultivation and planting. Missouri.

Cultural methods for corn, to test methods of preparing the ground, applying the water, and cultivating the crop. N.Mex.

Corn culture tests. S.C.

Tillage experiments with corn, including soil preparation and methods of cultivation. Tenn.

Tillage experiments with both corn and cotton. Tenn.

Rate-of-planting experiments with both corn and cotton. Tenn.

Thick and thin drilling of silage corn, ranging from 4 to 12 in. in rows 42 in. apart. Ohio.

Regularity of drop as affecting the yield of corn. Iowa.

The spacing of kernels in the hill as affecting the yield of corn. Iowa.

Kernels per hill as affecting the yield of corn. Iowa.

Time and method of thinning as affecting the yield of corn. Iowa.

The relation of stand of plants to yield, with corn. Ohio.

Spacing of corn and study of stands. Ark.

Experiments in spacing corn and cotton. Miss.

Corn (Cont.).

Time of application experiments with nitrate of soda for corn and cotton. Tenn.

The effect of different amounts and different methods of applying commercial fertilizers to the corn crop, to determine the effect of adding various amounts of commercial fertilizer to corn, both in the hill or drill and over the entire soil surface, upon the resulting crop. Missouri.

Time of applying nitrate of soda to corn. Ala.

Experiments with sources of nitrogen for corn. Ala.

Lime experiments with corn. Ala.

Fertilizer experiments with corn, to secure proper ration of nitrogen and phosphoric acid for corn, and to determine maximum profitable application of fertilizer on corn. La.

Fertilizer experiments with corn. Ala., Ark., La.

Fertilizer under and around corn. Ga.

Rate of application of fertilizer to corn. Ga.

A study of the best methods of checking the fertility of the soil in making variety tests of corn. Iowa.

Study of prolific and single eared varieties of corn under varying degrees of soil fertility. Ark.

The development of the various parts of the maize plant as influenced by variation in soil moisture, soil composition, and texture and the supply of plant food. Missouri.

A study in the selection and storage of seed corn as influencing vitality, including time of picking, method of storing, use of artificial heat, etc. Iowa.

The relation of care of seed corn to yield. Ohio.

The economic value of the germination test of seed corn. Ohio.

Effect of companion cropping of corn with legumes. S.C.

Investigation of associated growth of corn and soy beans. Wis.

Soy beans and corn as compared with corn alone for hogging down. Iowa.

Corn (Cont.).

A comparison of different varieties and different methods of planting soy beans in corn for silage and for hogging down. Iowa.

Velvet beans planted with corn. La.

Methods of planting velvet beans with corn. Ga.

Comparative use of legumes in rotation with corn, to secure comparative yields of corn grown after crops of cowpeas, soy bean, and velvet bean vines have been plowed under. La.

Experiments in growing peanuts in a rotation with corn and velvet beans. Fla.

The relation of previous conditions of growth to yield of corn as to stand and as to fertility. Ohio.

Preparation, composition, and the nutritive and economic value of corn silage. Ill.

A comparison of the relative food values per acre of silage made from large silage corn and common field corn. Ohio.

Salting soft corn as a means of reducing the loss from heating and molding. Iowa.

Method of drying soft corn in the crib so as to prevent loss from molding and heating. Iowa.

Changes taking place in corn and cornmeal when stored under different conditions. Ky.

Cotton.

Cotton. Miss.

Cotton variety tests. Ala., Ark., Ga., La., N.C., S.C.

Cotton variety experiments to determine practical value, including profit of cotton under Guam conditions; to test out different varieties and types of cotton, and to improve varieties and types found best adapted. Guam.

Cotton variety test to determine whether or not cotton can be successfully grown in the irrigated valleys, to ascertain as nearly as possible the best varieties under the climatic conditions, and to compare the short staple varieties and the long staple varieties. N.Mex.

Cotton: Wilt variety experiments. Ala.

Wilt resistant cotton varieties. La.

Cotton (Cont.).

Cooperative variety tests with cotton. Ark.

A study of the adaptation of the important varieties of cotton for the southeast Missouri lowlands. Missouri.

Cotton breeding. Ark.

Breeding experiments with cotton. Ala.

The genotypic constitution of certain varieties of cotton. N.C.

Place variation with cotton. N.C.

Effect of environmental factors upon time and rate of blooming in the cotton plant. Ga.

Relation of oil and nitrogen content of cottonseed to other characters. Ark.

Cotton multiplication. Ala.

Cotton breeding experiments to improve the quality, quantity, and disease resistance of the locally grown Sea Island cotton. Virgin Islands.

Breeding work with Cleveland Big Boll cotton. S.C.

Breeding work with Cook cotton. S.C.

Cotton wilt breeding experiments. Ala.

Development of varieties of cotton and cowpeas resistant to wilt and rootknot. S.C.

Attempts to secure a variety of short staple cotton that would do well in Florida under boll weevil conditions. Fla.

Dropping of cotton bolls. Ark.

Effect of soil on lint of cotton. Ga.

Cotton culture tests. S.C.

Cultural experiments with cotton at Imperial Valley. Calif.

Cultural experiments with cotton, including fertilizer tests, to determine the value of different mineral elements of plant food alone and in combination upon the yield and quality of cotton produced. Missouri.

Rate-of-planting experiments with both cotton and corn. Tenn.

Cotton (Cont.).

Cultural experiments with cotton, wheat, kafir, and oats. Okla.

Experiments in spacing cotton and corn. Miss.

Tillage experiments with both cotton and corn. Tenn.

"Cook's" system of growing cotton under local conditions, to verify the findings of other investigators who have reported on the Cook system. La.

Spacing experiments with cotton.--Space between rows - check spacing compared with drilling. Ark.

Thinning experiments with cotton. Tenn.

A study to determine the cause of the apparent inconsistency in results obtained by chemical analysis and field tests, with reference to the potash requirements of cotton. Ga.

Cotton: Date of planting, irrigation tests, thinning methods, intercropping with legumes, and leaving every third row blank. Ariz.

Dates of planting cotton. Ark.

Cotton fertilizer experiments. Ala.

Time of application experiments with nitrate of soda for cotton and corn. Tenn.

Top dressing cotton. Ga.

Residual effect of fertilizer for cotton. Ga.

Source of potash in cotton fertilizer. Ga.

Fertilizer tests with cotton. Ark.

Rate of application of fertilizer to cotton. Ga.

Time of applying nitrate of soda to cotton. Ala.

Sources of nitrogen experiments with cotton. Ala.

Source of nitrogen in cotton fertilizer. Ga.

Lime experiments with cotton. Ala.

The economic use to which bollies, or the miniature cotton bolls, may be placed. Okla.

Harvesting experiment with cotton to determine amount of loss in quality and quantity when left in the field until January. Ark.

Cotton (Cont.).

Chemical changes which take place in cottonseed during growth and factors affecting same. Okla.

Cottonseed storage. Ark.

Cowpeas.

Cowpea variety tests. Ala., La., S.C.

Cowpea and soy bean variety experiments. N.C.

A comparison of cowpeas with soy beans. Ohio.

- Cowpeas. - Comparison of the better known varieties with soy beans, both for total yield of hay and for ease of production. Iowa.

A study of the adaptations of the important varieties and selections of cowpeas to the various soil types of the State. Missouri.

Tests of varieties of cowpeas for seed and hay. Md.

Development of varieties of cowpeas and cotton resistant to wilt and root knot. S.C.

Green manuring experiments with cowpeas. Tenn.

The effect of the cowpea crop on soil fertility, with special regard to a wheat crop following and a corn crop following. A study of the nitrogen content of the soils is included. Tenn.

The effect of cowpea land handled in various ways, on the growth of wheat following, to determine the effect of growing cowpeas and handling them in various ways preceding a wheat crop, as compared with land receiving no cowpeas in the effect on the yield and character of the wheat. Missouri.

Crop breeding, general.

Crop breeding, including cereals, legumes, grasses, and forage crops. Mich.

Crop breeding, to study methods and to produce better varieties of crops, including corn, oats, wheat, barley, beans, potatoes, timothy, and others. Variety tests, selection, study of the progenies of these selections, elimination of poorer lines, mass and individual cultures, cross breeding, propagation of superior lines. N.Y. Cornell.

Breeding miscellaneous field crops. Minn.

Seed crop improvement. Colo.

Crop breeding, general (Cont.).

Improvement of certain crops by selection. Tenn.

Crop improvement experiments. Tex.

Crop improvement, to grow and study varieties of grains and forage crops as to adaption to Kansas conditions, to improve the best varieties by selection, to produce new varieties by hybridization, to increase and distribute the better varieties. Kans.

Cover crop breeding. Calif.

The production from single parent plants of improved strains. Mich.

A comparison between hill method and row method for determining relative yields of selected strains of plants. W. Va.

Culture experiments, general.

Cultural methods. Miss.

Tillage experiments. N. Dak.

Tillage investigations. Kans.

Continuous culture experiments.--Corn, oats, and wheat are each grown continuously at Wooster, and tobacco is grown continuously at Germantown. Ohio.

Dry land farming.

Dry land tillage studies. N. Dak.

Dry land rotation studies. N. Dak.

Soil moisture investigations as related to problems in dry farming. Wash.

Dry land agriculture investigations to determine the best methods of soil cultivation and crop rotation for the conservation of moisture and the maintenance of humus in dry land soils. Wyo.

Variety tests, rate and date of seeding tests, method of planting tests, inoculation of legumes, tests to determine whether dry farming to raise feed for stock is feasible, at the Prescott Dry Farm and Sulphur Spring Valley Dry Farm. Ariz.

Experiments with varieties and with cultural methods for forage crop and grain production under both dry farming and irrigation at an altitude in excess of 6,000 ft. Idaho.

Study of relations of soil water and crop in respect to irrigation and dry farming supplemented by irrigation. N. Mex.

Dry land farming (Cont.).

Investigations at Dry Farm Stations. Utah.

Investigations in dry-land agriculture. Kans.

Dry farm investigations to investigate crops suited to dry farming in high altitudes. Utah.

Fertilizer experiments.

Fertilizer, rotation, and soil improvement investigations. Tex.

Plant-lime experiments. Ala.

Crops limed v. not limed. Ala.

Fertilizer and lime tests in a rotation of cotton and corn. Ga.

A study of the lime and fertilizer requirements of alfalfa. Ind.

Field beans.

Variety tests of field beans. N.H.

Variety tests, selection, and improvement of field beans. Idaho.

The production of a disease resistant field bean. Mich.

Cultural experiments with field beans. Idaho.

Production of field beans. W. Va.

Field peas.

A test of varieties of field peas. Ohio.

Canadian field peas.--Comparison of different varieties and rates of seeding with oats for hay production. Iowa.

Variety tests, selection and improvement of field peas. Idaho.

Breeding of field and canning peas. Wis.

Cultural experiments with field peas. Idaho.

Field peas and oats at three different rates of seeding; also oats and hairy vetch. Ohio.

Canada peas for forage. Ala.

Questionnaire on field peas and beans. Idaho.

Flax.

Flax varietal experiments. Idaho.

Flax investigations. Calif.

Flax experiments. N. Dak.

Determination of the causes of resistance of flax to wilt. N. Dak.

Forage crops.

Test with forage crops and grasses.--Comparative. S.C.

Special forage crop trials. N. Dak.

A study of certain spring, summer, and fall sown crops for forage, to determine, if possible, the relative adaptation and productivity of certain spring, summer, and fall sown forage crops and the yield of several mixtures of these crops. Missouri.

Observations with summer forage crops to discover which are most promising for summer soiling. Mass.

Comparative tests of the annual forage crops for feed production using sunflowers, peas, and oats, Sudan grass, common millets, German millet, Siberian millet, Hungarian millet, Japanese millet, broom corn millet, hog millet, and pear millet. Wyo.

Trials of introduced forage crops. Fla.

Testing forage plants to ascertain what species of grasses and legumes are best suited to the peculiar conditions. Alaska.

Leguminous forage crops test to find legumes which can be successfully grown for forage. Alaska.

Study of general forage crops. Ark.

Forage crops and cereals tests. Idaho.

Combinations of the following forage crops: Soy beans and cowpeas; soy beans and hairy vetch at several different rates of seeding; sweet clover and hairy vetch; cowpeas and sorghum; silage corn and soy beans and flint corn and soy beans. Ohio.

Forage crop experiments to introduce and test leguminous plants as feed for animals. P.R.

Forage crop investigation to develop pasture and soiling crops adapted to local conditions. Guam.

Forage crops: Culture and improvement. Idaho.

Forage crops (Cont.).

Rate and date of seeding, methods of seeding and culture, date and methods of harvesting forage crops and grain, and variety tests. Physiological investigations with grains as to causes of winter-killing and sterility and of immunity of certain varieties of wheat to the Hessian fly. Kans.

Experiments with varieties and with cultural methods for forage crop and grain production under both dry farming and irrigation at an altitude in excess of 6,000 ft. Idaho.

Experiments in forage, green manure, and winter cover crops. Md.

Summer forage crop experiments. Ala.

Winter forage crop experiments. Ala.

Forage crop and grain production. Idaho.

Forage crop production. Kans.

Utilization of forage crops. N.Dak.

Forage crop investigations. Idaho, La., Minn., Miss., Nebr., Oreg., Va.

Grasses, general.

Test of grasses to learn which are best suited to interior Alaska. Alaska.

A comparison of 10 meadow grasses as regards yields, quality (including palatability) and permanency. Ohio.

Preparation of a manual of the wild and cultivated grasses of Maryland, by which they can be identified and their economic value determined. Md.

Brome grass studies. N.Dak.

Grasses of the Connecticut Valley. Mass.

Colorado forage grasses. Colo.

Economic study of grasses and grass-like plants. Ariz.

Grass and clover selection. W.Va.

Attempts to secure improved strains of timothy, clover, and other grasses. Maine.

A study of combination of different grasses and clovers as compared with straight seedings of grasses for meadow and pasture. Iowa.

Grasses, general (Cont.).

Study of grasses and mixtures for meadow and pasture. Ark.

Grass and clover mixtures. N.Y. Cornell.

Grasses and grass mixtures for pasture purposes. Nebr.

Experiments with grasses to obtain valuable fodder grasses for stock raising purposes. Virgin Island.

Grass and forage plant gardens. Calif.

Hay.

Methods of increasing hay production in the Humboldt River Valley.--
A study of the effect of various methods of irrigation upon the quantity and quality of hay produced. Nev.

Methods of handling hay. Colo.

The use of different crops for hay and for silage. S.Dak.

Comparative tests of short season hay crops. Mich.

Oats, tangier peas, and vetch for hay. Ala.

Hemp.

[Hemp culture]. Wis.

Hemp marketing investigations. Ky.

Hops.

Study of lupulin and other active principles of hops, including effects of high and low temperature in drying, upon these principles and the value of cured hops. Oreg.

Johnson grass.

Johnson grass eradication, to determine a practical method for eradicating Johnson grass. N.Mex.

Experiments on the eradication of Johnson grass by kudzu. La.

Kafir.

Cultural experiments with kafir, cotton, wheat, and oats. Okla.

Kudzu.

Effect of kudzu for soil improvement. Ala.

Kudzu multiplication. Ala.

Legumes. (See also Alfalfa, clover, and sweet clover.)

Legume garden of 28 species and varieties. Ohio.

Trials with various legumes for green dressing purposes.--To find a legume resistant to caterpillar and fungus attacks, which will be suitable for green dressing purposes. Virgin Islands.

Legume tests for grain purposes.--To find a profitable legume to grow in St. Croix to provide grain for human consumption. Virgin Islands.

Value of lime for legumes.--To determine if the use of lime is essential on North Carolina soils for a success in the growth of leguminous crops. N.C.

Legume culture work. Wash.

Legume seeding and cultural work. Rate and date of seeding tests and culture tests of soy beans and cowpeas at Coastal Plain and Mountain branch stations. N.C.

Comparative use of legumes in rotation with corn, to secure comparative yields of corn grown after crops of cowpeas, soy bean, and velvet bean vines have been plowed under. La.

Leguminous food crops. Increase of food-producing crops of the Island. P.R.

Value of legumes in crop production. R.I.

The improvement of germination of hard seeds of legumes and a study of seed laboratory records relative to the fixation of grades of small seeds. Oreg.

Botanical study of Lespedeza striata, with reference to life history, habits, and improvement. Tenn.

Legumes, inoculation experiments. (See also Soils, nitrogen assimilation.)

The inoculation of legumes. Iowa.

A test of the value and method of inoculation for soy beans; three different commercial cultures compared with infected soil. Ohio.

Effect of cross inoculation on the growth of legumes. N.Y. Cornell.

A study to ascertain the necessity for inoculation and the possibility of increasing yields by intercropping with legumes. Ariz.

Production and distribution of bacteria for legumes. Missouri.

Legumes, inoculation experiments (Cont.).

A comparison of seven different commercial bacterial cultures and infected soils in the inoculation of alfalfa, hairy vetch, and soy beans. Ohio.

A comparison of different inoculating cultures. Wash.

The commercial preparation of cultures for the inoculation of legumes with nitrogen-gathering bacteria. Idaho.

Manure experiments.

A study of the comparative returns from manure applied immediately prior to the seeding of wheat and the seeding of cowpeas in a cowpea-wheat rotation. Tenn.

Millets.

A variety test of millets, including Sudan grass. Ohio.

Experiments in the growing and introduction of proso. S. Dak.

Oats.

Oat variety tests. Ala.; La., S.C., W. Va.

Oat variety tests to learn which varieties are best suited to the climate. Alaska.

Investigations with winter oats; including variety tests and improvements, to determine the adaptation of different standard varieties of winter oats to various sections of the State; to improve the quality, to increase the hardiness and to increase the yield of winter oats by developing improved strains through hybridization and selection. Missouri.

Variety tests and selections of hardy strains of winter oats. Md.

Variety testing and head selection of oats for yield and early maturity. Wyo.

A test of commercial varieties of oats also pedigreed varieties developed in breeding work. Iowa.

A study of oat varieties with a view to their improvement. Penn.

Variety experiments with winter and spring oats. Ark.

Variety test of oats: Varieties grown in one-tenth acre plats, pure-line strains grown in one-hundredth acre plats, second-year pure-lines grown in eighteen-foot rows and duplicated; first-year pure-lines grown in head-row tests. Ohio.

Oats (Cont.).

Oat breeding.--Variety tests and the production of new and improved strains originating in the new breeding work. Maine.

Oat group studies.--A large number of varieties belonging to a certain group, which are grouped together botanically but which may differ in qualities not discernible in a botanical examination, are grown side by side and data taken in yield. N. Y. Cornell.

A comparison of pedigreed varieties of oats with common seed. Iowa.

Iowa 103 oats compared with home variety for yield of grain. Iowa.

Comparison of Iowa 105 oats with home variety for yield of grain. Iowa.

Oat breeding, variety tests, pure-line selections, and hybridizing. Maine.

Deterioration in home-grown seed oats. Conn. Storrs.

A comparison of secondary with primary grains in pure-line strains of oats. Ohio.

Breeding experiments with oats. Ala.

Oat breeding to develop earlier and better varieties. Alaska.

Oat breeding for increased yield, greater strength of straw and rust resistance. Iowa.

Isolation and propagation of pedigreed strains of oats. Maine.

Hybridizing oats, with the object of combining the desirable qualities of the two varieties into a single strain and to eliminate as many of the bad characters as possible. Maine.

Inheritance in oats. S. C.

Oat improvement. Penn.

Oat multiplication. Ala.

Cultural experiments with oats, kafir, cotton, and wheat. Okla.

The relation of rate of seeding oats to yield. Ohio.

Rates of seeding oats. Ark.

Time and rate of seeding oats and wheat. Conn. Storrs.

Rate and time of seeding oats, wheat, and barley. Wyo.

Oats (Cont.).

Date-of-planting experiments with oats, wheat, and barley. Tenn.

Dates of seeding oats. Ark.

The relation of preparation of seed bed for oats, to yield. Ohio.

Cultural test with oats and barley. Nebr.

Methods of planting oats after cotton. Ala.

The effect of the space between drill rows on yield of oats. Iowa.

Influence of methods of seeding on yield of oats. Iowa.

Oat and barley breeding. Wis.

Comparison of different rates of seeding oats as influencing the yield. Iowa.

The effect of direction of seeding oats on yield. Iowa.

Potash for oats.--To test the effect of potash as a limiting factor for a crop like oats. Maine.

Oats compared with spring wheat. Iowa.

Oats as compared with barley for greatest production of food units. Iowa.

Field peas and oats at three different rates of seeding; also oats and hairy vetch. Ohio.

The relation of quality of seed of oats, as graded by the fanning mill, to yield. Ohio.

Effect of stage of maturity at harvest upon the germination power of oats, wheat, and barley. Wyo.

Pasture.

Pastures. Miss.

Pasture investigations. Ind., N.Y., Cornell, Okla., Penn., Va.

Grass pasture. Nebr.

Grasses and grass mixtures for pasture purposes. Nebr.

Study of grasses and mixtures for meadow and pasture. Ark.

Sweet clover v. red clover as a legume for pasture purposes. Tenn.

Pasture (Cont.).

Pasture renovation. W.Va.

Pasture yields.--To determine the number of cattle, sheep, or horses which can be pastured on an acre of various pastures, and in the case of fattening and growing stock, the number of pounds of gain obtained for the same. Oreg.

Pasture survey, with attention given to the succession of vegetation in different methods of handling. Utah.

Pasture conditions in West Virginia. W.Va.

Yard manure, fertilizers, and lime on pastures. Penn.

Peanuts.

Variety tests of peanuts. Ark., Ga., Iowa, N.C., S.C.

Peanut variety, fertilizer, and culture tests. S.C.

Cultural tests with peanuts. Ark.

A comparison of methods of seeding peanuts. Iowa.

Fertilizer tests with peanuts, including the application of various forms of lime. Ga.

Fertilizer experiments with peanuts. Fla.

Experiments in growing peanuts in a rotation with corn and velvet beans. Fla.

Potatoes, Irish.

Variety tests of potatoes. Mont., Ohio, W.Va.

Potato variety tests to find the varieties best suited to Alaska. Alaska.

Variety tests of nonirrigated potatoes. Mont.

A study of the varieties of potatoes with a view to improving those best adapted to Pennsylvania conditions. Penn.

Potato varieties and cultural methods. N.Dak.

Potato varietal experiments and tuber unit improvement. Idaho.

Variation in the yield of potato plants from the two halves of the same tuber divided lengthwise. N.Y. State.

Potatoes, Irish (Cont.).

A study of degeneracy in potatoes- rapidity- factors causing, and means of control. Nebr.

Regeneration in potato tubers. Md.

Selection of high-yielding strains of potatoes by the "tuber unit" method. Wyo.

Seed selection work with potatoes to determine the accumulative effect of planting cull potatoes for seed. Mont.

Irish potato seed improvement. La.

Potato improvement and cultural experiments. Oreg.

Potato improvement by the hill selection and tuber unit method to determine its practicability for the truck grower. Calif.

Selection, germination, and storage studies of white potatoes. Ark.

Tuber line selection of potatoes for increased yield. Nebr.

Hill selection of potatoes. Penn.

Potato breeding. Utah.

Irish potato breeding. W.Va.

Potato breeding experiments.--Testing northern-grown certified or inspected seed potatoes at Fort Gibson and Stillwater, Okla. Okla.

Potato breeding.--Selected seed raised by the U.S. Department of Agriculture are tested under field conditions and grown for distribution to farmers. Maine.

Study of conditions affecting the production of potatoes in Arizona. Ariz.

Reason for the failure of potato tubers to develop properly in parts of New Mexico. N.Mex.

Influence of climate upon the degeneration of potatoes: A comparison of northern-grown with southern-grown seed. N.Y. State.

Pathological anatomy of the potato. N.Y. Cornell.

Relation between the nature of the growth of the potato plant to yield and quality. Wyo.

A comparison of northern and locally grown "Triumph" Irish potato seed. La.

Potatoes, Irish (Cont.).

Chemical and physical behavior of potatoes in the ground after death of vines. Md.

Potato cultural investigations. Idaho, W.Va.

Potato culture test to learn how to grow potatoes with best results. Alaska.

Comparison of straw mulch and cultivation in dry land potatoes. Mont.

Mulching potatoes on irrigated land. Mont.

Missing hills in potato field. Their effect upon the yield. N.Y. State.

Effect of the distance apart in row and of missing hills on yield and quality of potatoes. Wyo.

Thinning experiments with potatoes.--Tests of one or more stems to a hill and tests of dates of thinning. Mont.

Thinning nonirrigated potatoes. Mont.

Thick v. thin planting of potatoes, 6 in. v. 15 in. N.Y. State.

Distance of planting potatoes on irrigated land. Mont.

Distance of planting potatoes. Mont.

Cultivation of nonirrigated potatoes. Mont.

Yielding power of irrigated v. nonirrigated potatoes. Mont.

Experiment on potash as a limiting factor in potato growing. Maine.

Mineral requirements of the potato plant. Md.

Soil and fertilizer work with potatoes to study the influence of different fertilizer ratios, commercial fertilizers, and soil amendments on mosaic and other diseases and physiological reactions from such treatments. Maine.

Fertilizer and malnutrition experiments on potatoes. Maine.

Potato fertilizer experiment. N.J.

Potato fertilization. Wis.

Fertilizer experiments with white potatoes. Ark.

Potato spraying. Iowa.

Potatoes, Irish (Cont.).

Potato spraying experiments. Maine.

Spraying experiments with Irish potatoes. Ga.

Studies of Bordeaux stimulation on potato plants. N.J.

The stimulating effect of Bordeaux mixture on plants, especially the potato plant. Vt.

Potato seed studies. Iowa.

Production of home-grown potato seed. N.J.

Source of potato seed, etc. N.J.

Size of seed piece of potatoes. N.J.

A study of the factors influencing seed production and tuber formation in Irish potatoes. S.C.

Seed potato growing in high altitudes. Colo.

Investigations with seed potatoes. Missouri.

Seed potato production. Wash.

Production of seedling potatoes. Penn.

Transmission of organisms in seed potatoes. Oreg.

Seed studies with potatoes, influence of various factors on the productiveness of their tubers. Conn. Storrs.

Test of adaptability of seedling potatoes, originated at Sitka and Matanuska Valley. Alaska.

Seed treatment of Irish potatoes. Ark.

Detailed experiments in seed treatment and spraying potatoes. Ohio.

Sprouting of early Irish potatoes for second crop. Ala.

Large y. small tubers of the same potato plant: A comparison of their value for seed purposes. N.Y. State.

Effect of different sized portions of seed at different moisture content on the early growth of the potato plant. Wyo.

Effect of the size and portion of seed per tuber used on the growth and yield of the potato plant. Wyo.

Potatoes, Irish (Cont.).

Effect of various storage conditions on the quality and seed value of root crops, with special reference to potatoes. Md.

Effect of temperature on the keeping quality of potatoes. N.H.

Potato experiments. Va.

Irish potato experiments. N.C.

Potato investigations. Colo., Ind., Kans., Minn.

Potato experiments. Idaho.

Potatoes. Nebr.

Irish potatoes. Ky.

Range studies. (See also Animal Husbandry.--Cattle, grazing and range experiments.)

White sage studies. Nev.

Plains crops and management. Colo.

Maintenance of forage supply in the mountain regions of California. Calif.

A study of range improvement through fencing. Ariz.

Revegetation of depleted ranges. The reestablishment of native range forage plants. A study of methods of increasing the carrying capacity of sheep and cattle ranges. Nev.

Range survey. Utah.

Botanical and economic study of poison range plants. Ariz.

Residual effect of crops. (See similar heading under Soils. Also Rotations under Field crops.)

Rice.

Variety tests with rice. Ala., La.

Variety and fertilizer tests with rice to determine the most desirable variety or varieties of rice for Guam and to study the effect of different fertilizing constituents upon rice production on the principal types of Guam soils. Guam.

Fertilizer experiments, in which the same kind and amount of commercial fertilizer has been applied to the land each year since 1910 and planted in rice continuously. La.

Rice (Cont.).

Effect of environment on the development of the rice plant. Tex.

Methods of cultivation of rice. La.

Irrigation experiments with rice. La.

Duty of water in rice irrigation in California. Calif.

The optimum reaction for rice culture, to study the critical hydrogen-ion concentration in rice culture and the effect of the use of different fertilizers on the reaction of the medium. P.R.

Improvement of the rice industry of the island, the study of the rice plant and to give this crop a place in a system of rotation with cane and legumes on the cane lands of the island. P.R.

Rotations. (See also Soils, fertility.)

Crop rotations. Mont., R.I., Wash.

Crop rotation experiments. N.Dak.

Crop rotation investigations. Minn.

Studies in crop rotations. Md.

A study of various crop rotations. Del.

Rotation experiments. Calif.

Rotation of crops for Colorado. Colo.

A test of rotations for the Boise Valley region. Idaho.

A comparative study of various crop rotations. Tenn.

A series of rotative cropping experiments. Ohio.

Rotation plats, all being for grain, but in some, cultivated crops are introduced and in others not. Comparative relations to show the relative merits of grass or clover when alternated with grain or cultivated crops. Each rotation is carried without fertilizer and manure, with commercial fertilizer, and with a combination of both fertilizer and manure. N.Y. Cornell.

Fertilizer and rotation experiments. La.

Rotations and fertility tests. Utah.

Crop rotation and fertilization experiments. Idaho.

Fertilizer and lime tests in a rotation of cotton and corn. Ga.

Rotations (Cont.).

Various rotations, with special reference to their value for dairy-men. Conn. Storrs.

Rotations. A comparison of the value of green manures, barnyard manures, and summer fallow, using sweet clover and rye as green manures. Wyo.

Experiments to determine the best place for the application of farm-yard manure in a standard five-year crop rotation. Tenn.

Three-year rotation experiment. La.

Two, three, and four year rotation experiments. Miss.

Fertility experiments in a five-year rotation. Tenn.

Rotation, fertilizer, and soil improvement investigations. Tex.

A comparative study of different systems of cropping or crop rotation. Ind.

Fertility rotation experiments to determine the best long and short rotations for maintaining and increasing fertility under western Oregon conditions. Oreg.

Crop rotation and fertility.--From 1907 to 1916 four series were standardized by keeping accurate weights of crops. The following crops having been grown in rotation: Oats, cowpeas, kafir, cotton. Small grain fertility rotation. Bottom land rotation: To determine the advisability of growing alfalfa, corn and annual legumes in rotation on bottom land. Okla.

Crop rotation and fertilizer experiments to determine the influence of various rotations maintaining soil fertility. Missouri.

Various rotations with the view to definitely observing the comparative effects upon crop yields. To get quantitative information to show the advantage of rotations over continuous cropping. S.Dak.

A rotation test involving the growing of ten different field crops in continuous culture; in ten different 2-year rotations; in ten 3-year rotations; in ten 4-year rotations; and ten 5-year rotations, the average annual treatment of the soil with respect to lime, fertilizers and manures being the same in the continuous culture and each rotation. Ohio.

Rotation experiments to compare continuous cropping of the same crop with different rotations with and without legumes and with and without fertilizers. N.C.

Experiments in growing peanuts in a rotation with velvet beans and corn. Fla.

Rotations (Cont.).

- A study of the comparative returns from manure applied immediately prior to the seeding of wheat and the seeding of cowpeas in a cow-pea-wheat rotation. Tenn.
- A comparison of the use of clover for hay with its direct use as a fertilizer in a 3-year rotation of corn, wheat, and clover, and when used as a fertilizer, a further comparison of plowing it under at different times. Ohio.
- Comparative use of legumes in rotation with corn.--To secure comparative yields of corn grown after crops of cowpeas, soy bean, and velvet bean vines have been plowed under. La.
- Crop relations, comparative effect of tobacco and other crops on yields of succeeding crops. Md.
- Experiment to determine the effects upon tobacco following after cowpeas.--To show whether by making proper allowance in fertilizing tobacco, for the ammonia supplied by the legume, it is possible to produce a tobacco of high quality. N.C.
- A study of rotation systems for tobacco growers in Granville section. N.C.
- Crop rotations, pure seed production, tillage, and manuring. N.Dak.
- Rotation and tillage methods. Nebr.
- Rotation of crops under irrigation. Nebr.
- Fertility investigations with continuous cropping (corn). The effects of manure and lime. Iowa.
- Fertility investigations with a two-year crop rotation.--The effect of manure and crop residues. The effect of rock phosphate with manure (live stock system). The effect of rock phosphate with crop residues (grain system). Iowa.
- Fertility investigations with a three-year crop rotation.--The effect of manure and crop residue. The effect of rock phosphate with crop residues (grain system). The effect of rock phosphate with manure (live stock system). Iowa.
- Fertility investigations with a four-year crop rotation.--The effect of various applications of manure and of crop residues. The effect of rock phosphate, bone meal, acid phosphate, potassium salts and complete commercial fertilizers with manure (live stock system). The effect of the same fertilizers with crop residues (grain system, no manure). The applications of complete commercial fertilizers broadcasted or applied in the hill. The effect of limestone and air-slaked lime. Iowa.

Rotations (Cont.).

Fertility investigations with a five-year crop rotation, including alfalfa.--The effect of manure and crop residues. The effect of rock phosphate and acid phosphate with manure (live stock system). The effect of phosphates with crop residues (grain system). Iowa.

Rye.

Variety experiments with rye and wheat. Ark.

Rye variety tests, to find a winter rye which shall be entirely hardy in Alaska. Alaska.

Comparison of Rosen rye with Abruzzi rye. La.

Breeding work with rye. S.C.

Silage crops.

A test of 14 varieties of corn for silage. Ohio.

Varieties of ensilage corn. N.J.

Variety tests of ensilage corn. N.H.

A comparison of different varieties and different methods of planting soy beans in corn for silage and for hogging down. Iowa.

The use of different crops for silage and for hay. S.Dak.

Silage crops following oats. La.

Thick and thin drilling of silage corn, ranging from 4 to 12 in. in rows 42 in. apart. Ohio.

Soy beans and corn as compared with corn alone for silage. Iowa.

Study of soy beans grown with corn for silage. Conn. Storrs.

A test of the practicability of growing soy beans with corn for ensilage. Penn.

A comparison of the relative food values per acre of silage made from large silage corn and common field corn. Ohio.

To determine the relative feeding value of corn silage when corn is cut at different stages of maturity. S.Dak.

Sisal.

Sisal growing, to find a profitable crop in very dry lands now unproductive. P.R.

Sorghums.

Variety tests with sorghums. Ark., Ohio.

A comparison of varieties of sorghum for yield of sirup. Iowa.

A comparison of varieties of sorghum for yield of fodder. Iowa.

Selective inbreeding in grain sorghums and the influence of environment on the plant. Tex.

Sorghum breeding for high sugar content. Iowa.

A study of the formation of sucrose in the sweet sorghums. Okla.

Fertilizer experiment with sorghums. Ark.

Milling grain sorghums. Kans.

Chemical study of the grain sorghums. Okla.

Sorghum investigations. Minn.

Soy beans.

Variety tests with soy beans. Ga., La., Iowa, S.C., W.Va.

Soy bean and cowpea variety experiments. N.C.

A test of varieties of soy beans grown for seed and for hay. Ohio.

Comparison of two varieties of soy beans to determine their adaptation to different sections of the State. Iowa.

Soy beans and corn as compared with corn alone for silage. Iowa.

Soy bean investigation. --Adaptation of imported varieties, selection of superior types, tests of yields for hay and seed of varieties. Md.

A comparison of soy beans with cowpeas. Ohio.

Bean tests, extended to include navy beans, and pinto beans, in addition to soy beans. Nebr.

A study of the adaptation of the important varieties and selections of soy beans to the various soil types of the State. Missouri.

A comparison of different varieties of navy beans and other standard sorts with soy beans for yield of edible beans. Iowa.

A comparison of different varieties and different methods of planting soy beans in corn for silage and for hogging down. Iowa.

Soy beans (Cont.).

Comparison of the better known varieties of soy beans with cowpeas, both for total yield of hay and for ease of production. Iowa.

Varieties of soy beans and soy beans v. oats in rotation. Penn.

Varieties of soy beans and seed production. Conn. Storrs.

A study of soy bean hybridization, to yield fundamental principles necessary of solution for the successful improvement of soy beans by different methods of breeding. Iowa.

Soy bean breeding. Ind., Wis.

Soy bean breeding for varieties especially suited to Iowa conditions, Iowa.

A plant-to-row test of selected individuals of soy beans. Ohio.

Rate-of-planting experiments with both soy beans and corn. Tenn.

Comparison of different methods of cultivating soy beans. Iowa.

Methods of seeding soy beans as influencing yield and freedom from weeds. Iowa.

The time of seeding standard varieties of soy beans as influencing the yield of hay and of seed. Iowa.

Rate of seeding soy beans for maximum hay production and for maximum seed production. Iowa.

A test of rate of seeding, ranging from one to eight pecks per acre, with soy beans. Ohio.

Cultural experiments with soy beans, including time, method, and rate of seeding. Missouri.

Rate of seeding and cultural methods in the production of soy beans. Ind.

Soy bean inoculation tests to determine the need of inoculating soy beans on different soils of the State. Iowa.

A test of the value and method of inoculation for soy beans; three different commercial cultures compared with infected soil. Ohio.

Effect of inoculation of soy bean seed on nitrogen content of plants. Wis.

Soy beans and corn as compared with corn alone for hogging down. Iowa.

Soy beans (Cont.).

Investigation of associated growth of soy beans and corn. Wis.

A test of the practicability of growing soy beans with corn for ensilage. Penn.

Study of soy beans grown with corn for silage. Conn. Storrs.

Soy bean studies, including usefulness of soy beans for feeding purposes in Iowa; feeding value at different stages of growth, composition at different stages of growth, its use for hay and relative feeding value as compared to ordinary hay. To work out the value of soy beans used as a grain ration and to investigate various possible uses. Iowa.

Sudan grass.

A variety test of millets, including Sudan grass. Ohio.

A study of the cultural requirements and adaptation of Sudan grass.-- To determine the adaptation of Sudan grass and ascertain the most satisfactory cultural practices. Missouri.

A comparison of different methods of seeding Sudan grass. Iowa.

Date, rate, and methods of seeding Sudan grass. Ind.

Rate of seeding Sudan grass. Iowa.

Methods of seeding Sudan grass. Iowa.

The influence of the number of cuttings and the time of cutting on the quality and yields of Sudan grass hay. Iowa.

Hay harvesting of Sudan grass.--Complete feed analysis on samples of Sudan grass hay at various stages of growth. Okla.

Method of cutting and curing Sudan grass for hay. Iowa.

Value of Sudan grass as forage crop for Wisconsin. Wis.

Sudan grass seeded at different rates, ranging from 5 to 30 lbs.; drilled in rows 8 to 32 in. apart and cut at different stages of growth. It is also being compared with German millet. Ohio.

Sudan grass for pasture. Kans.

Sugar beets.

A variety test of mangels and sugar beets. Ohio.

To increase the sugar content of sugar beets by means of selection of mother beets of high sugar content. Idaho.

Sugar beets. (Cont.)

Sugar beet improvement work. Idaho.

The development of the sugar beet by selection for type as related to sugar content. S. Dak.

Sugar-beet breeding. Utah.

Time of thinning tests with sugar beets. Nebr.

Sugar beet studies, --To determine best date of spring planting and best date of fall planting; to compare the furrow y. flooding method of irrigation; to compare effect on germination of irrigating before planting and irrigation after planting. N. Mex.

Sugar beet seed production. Minn.

Commercial beet seed production. Utah.

Commercial growing and breeding of sugar beet seed in California. Calif.

Sugar beets for sirup. Iowa.

Sunflowers.

Tests of adaptation and use of sunflowers and disease-resistant strains. Mich.

Sweet clover. (See Clover, sweet.)

Sweet potatoes.

Varieties of sweet potatoes best suited to the section and also a study of the control of various diseases. Okla.

To learn best varieties and cultural methods for sweet potatoes, yautias, and dasheens for Porto Rico. P.R.

Sweet potato selection to isolate types found in ordinary seed and of developing by selection, improved strains. Ill.

Nature of the physiological changes in stored sweet potatoes. Ala.

A comparison of hard, soft, and acid phosphates on sweet potatoes. Fla.

Sweet potato manuring tests to determine value of farmyard manure in the culture of sweet potatoes. Virgin Islands.

Fertilizer and variety studies of sweet potatoes. S.C.

Fertilization of sweet potatoes. Ga.

Sweet potatoes. (Cont.).

Fertilizer experiments with sweet potatoes. Ala., Fla.

The economics side of storing and marketing sweet potatoes. Tex.

A study of cultural and storage methods of the sweet potato. Ariz.

Sweet potato experiments. Ark., Ky., N.C.

Timothy.

Timothy breeding for increased yield and improved quality. Iowa.

The increase of superior strains of timothy isolated from breeding work beginning in 1910. Iowa.

Timothy improvement. Penn.

Tobacco.

Variety tests of tobacco. N.C.

Variety test of cigar filler tobacco. Penn.

Tobacco variety and curing tests. W.Va.

Variety, fertilizer, and insect enemy studies of tobacco.--To determine the most desirable variety or varieties of tobacco for Guam; to study the insect pests and determine the best methods for their destruction, and to determine the fertilizer requirements of tobacco on the different soil types of Guam. Guam.

Maryland export tobacco investigations.--To improve by breeding and selection, to determine the best fertilizers, best systems of crop rotation, methods of growing, curing, and handling and control of important diseases. Md.

Breeding work in tobaccos and distribution of seed of new kinds. Ohio.

Breeding investigations with tobacco. Conn. State.

Tobacco experiment to test Davis Zimmer hybrid. Penn.

Tobacco experiments.--Seed selection. Penn.

Crop relations, comparative effect of tobacco and other crops on yields of succeeding crops. Md.

Tobacco plant nutrition investigations. N.C.

Tobacco (Cont.).

Study of closer planting of tobacco or combined with more intensive fertilizing, to see if by more intensive fertilization and closer planting the yield can be increased without injuring the quality. N.C.

Priming v. cutting tobacco. N.C.

Effect of soil treatment on quality of tobacco. Ohio.

Experiment to determine the effects upon tobacco following after cowpeas. To show whether by making proper allowance in fertilizing tobacco, for the ammonia supplied by the legume, it is possible to produce a tobacco of high quality. N.C.

Residual effect of fertilizers on tobacco. N.C.

Effect of liberal supply of humus on bright tobacco. N.C.

Study of the best amount of potash for tobacco. To observe effects of different amounts of potash ranging from 12 to 80 lbs. per acre—both sulphate and ^muriate and to get actual yield per acre from different amounts of potash. N.C.

Study of the value of farm manures, tobacco stalks, and stems and wood ashes in supplying plant food for tobacco, the above checked against commercial fertilizers. N.C.

Cooperative tobacco fertilizer tests. W.Va.

Fertilizers for tobacco. Va.

Fertility experiments with tobacco. Tenn.

Fertilizer experiments with tobacco. One-twentieth acre plats rotation of tobacco, oats, and corn with clover or rye as cover crop. To determine best source of nitrogen, phosphoric acid, and potash for tobacco and best combination of these. N.C.

Fertilizer experiments with tobacco to determine the best and most profitable amounts of fertilizers to use on tobacco. N.C.

Effect of various systems of cropping on the yield and quality of dark leaf tobacco. Tenn.

Growing tobacco continuously on blue grass soil. Ky.

A study of rotation systems for tobacco growers, in Granville section. N.C.

Tobacco seed production. Md.

Tobacco (Cont.).

Establishment and maintenance of permanent tobacco seed beds, bed to be sterilized each year by steam. N.C.

Variety tests, general.

Varietal trials, including winter and spring wheat, winter and spring barley, and spring oats. Oreg.

Variety tests of corn, oats, and wheat at experiment farms. Ohio.

Variety tests, selection, and breeding of small grains. Idaho.

Variety trials with wheat, barley, and oats in plats. Calif.

A study of the varieties and methods of culture of Indian corn and the various sorghums. Ariz.

Variety trials with field peas and eight vetches. Calif.

Tests of varieties of legumes adapted to southwestern conditions, valuable for soil building purposes and for crops produced, including Canada field peas, Colorado stock peas, purple garbanzos, cow-peas, soy beans, and alfalfa. Ariz.

Selective studies and comparisons of varieties and strains of forage plants. Ky.

Testing varieties of corn, wheat, soy beans, and oats. Del.

A varietal and cultural test of grain and forage crops and of grasses and miscellaneous crops. Ariz.

Variety tests of grain and forage. Mont.

Tests of promising varieties of grains and alfalfa and of ensilage crops. Nev.

Variety and selection work with corn, soy beans, and alfalfa. N.Y. State.

Variety tests of corn, oats, and soy beans. Ohio.

Variety tests of corn and wheat, and alfalfa work. Ohio.

Variety tests of corn and soy beans, and a rate of seeding test of corn. Ohio.

Variety tests of corn, wheat, and oats, and work with alfalfa. Ohio.

Variety tests of corn, oats, and soy beans, and a rate of seeding test of corn. Ohio.

Variety tests, general (Cont.).

Variety tests of corn, oats, cotton, wheat, cowpeas, grain sorghums, and sweet sorghums. Okla.

Variety tests of corn, wheat, oats, rye, barley, and alfalfa. S. Dak.

Variety trials with various farm crops, such as corn, wheat, oats, soy beans, vetch, etc. Tenn.

Collecting and testing varieties of corn, small grains, beans, and soy beans, at the station and other points in the State in order to determine the measure of adaptability in each case to the local requirements. Mich.

Testing varieties of farm crops. Ind.

Variety tests. N. Dak.

Variety trials of various farm crops. Tenn.

Field crop varieties. Wash.

Velvet beans.

Variety tests with velvet beans. Ga., La., S.C.

Variety study of the velvet bean. Ark.

Methods of planting velvet beans with corn. Ga.

Velvet beans planted with corn. La.

Experiments in growing peanuts in a rotation with corn and velvet beans. Fla.

A chemical study of the velvet bean. Ala.

Vetch.

Field peas and oats at three different rates of seeding; also hairy vetch and oats. Ohio.

Wheat. (See also Foods and Human nutrition,--Milling and baking.)

Wheat variety tests. S.C., W. Va.

Variety experiments with wheat and rye. Ark.

Cooperative study of durum, poulard, and bread wheats. Ariz.

An investigation of the "Hessian-fly-resistant" qualities of different varieties of wheat. Missouri.

Wheat (Cont.).

Yield, composition, and quality of Montana wheats. Mont.

A test of the more promising varieties of spring wheat. Iowa.

Spring wheat.--Comparison of Marquis and early Java. Iowa.

Variety testing and head selection of wheat for yield and early maturity. Wyo.

Cooperative trials comparing pedigreed varieties of wheat with common seed. Iowa.

Wheat variety tests and improvement by selection and breeding. Md.

A study of the varieties of wheat with a view to their improvement. Penn.

Variety tests of wheat.--Varieties, many of which are pure-line selections, grown in tenth-acre plats; pure-line strains grown in one-hundredth acre plats; second-year pure-lines grown in eighteen-foot rows; first-year pure-lines in head-to-row tests. Ohio.

A study of the adaptations of the important varieties of wheat to Missouri conditions.--To determine the adaptations of varieties of wheat to various soil types of the State. Missouri.

Variety tests and selection with wheat in order to secure a strain that will maintain its hard qualities in Arcostock. Maine.

A test of commercial varieties of wheat, also pedigreed varieties developed from the breeding work. Iowa.

Variety tests to find an early spring wheat and a hardy winter wheat. Alaska.

Wheat multiplication. Ala.

Improvement of wheat by hybridization and selection. Tenn.

Community wheat improvement work. N.C.

Wheat improvement. Penn.

Wheat breeding. Ind., Wis.

Breeding work with wheat. S.C.

Wheat breeding investigations, including the improvement of commercial varieties by the pure line method of breeding and hybridization and subsequent selection. To improve quality and increase yield of winter wheat for Missouri. Missouri.

Wheat (Cont.).

Breeding wheat for increased yield, better quality and hardness.
Iowa.

Wheat breeding.--To develop, if possible, both spring and winter varieties which shall be suited to the Alaska climate. Alaska.

Physiological investigations with grains as to causes of winter-killing and sterility and of immunity of certain varieties of wheat to the Hessian fly. Rate and date of seeding, methods of seeding and culture, date, and methods of harvesting forage crops and grain and variety tests. Kans.

Yellow-berry in wheat. Kans.

Yellow-berry in Montana wheat. Mont.

Clipping winter wheat in the spring at different heights when it has attained a growth of 8 to 10 in. Ohio.

Relation of the composition of wheat to soil types. Wash.

A study of the factors which influence the protein content of the wheat kernel. Idaho.

Effect of stage of maturity at harvest upon the germination power of wheat, oats, and barley. Wyo.

Differences in the extent to which different types of wheat respond to various kinds and quantities of plant food. Del.

Influence of cultivation on nitrogen content and yield of wheat.
Wash.

Winterkilling of wheat. Mont.

A study of winterkilling of wheat, as influenced by the variety, the time of seeding, the rate of seeding, the depth of planting, planting in furrows as compared with surface planting. Iowa.

Cultural experiments with wheat, cotton, kafir, and oats. Okla.

Date-of-planting experiments with wheat, oats, and barley. Tenn.

Mulching winter wheat with different amounts of straw per acre during the late fall or early winter. Ohio.

Cultivation and rate of seeding wheat. Wash.

Preparing seedbeds for wheat in different ways; plowing at different dates, disking and plowing, and disking only. Ohio.

The relation of rate of seeding, ranging from three to ten pecks, to yield of wheat. Ohio.

Wheat (Cont.).

The relation of early and late seeding to yield of wheat. Ohio.

Rate and time of seeding wheat, oats, and barley. Wyo.

Rates and methods of seeding wheat. Ind.

A comparison of different rates of seeding wheat. Iowa.

A comparison of different methods of seeding wheat. Iowa.

Time and rate of seeding wheat and oats. Conn. Storrs.

Dates and rates of planting wheat. Ark.

Fertilizer test on wheat. Ala.

A chemical study of the wheat crop growing on differently treated soils. Ohio.

A test of different grades of wheat as separated by the ordinary fanning mill. Ohio.

Wheat storage and shrinkage. Kans.

Dates of harvesting y. germination of wheat. Mont.

Durum wheat investigations. N. Dak.

Winter wheat. Nebr.

Spring wheat. Nebr.

Spring wheat compared with oats. Iowa.

Miscellaneous.

Time of seeding and intertillage studies. Tex.

Time and method of seedbed preparation. Tex.

The mineral composition of crops grown on different types of Idaho soils. Idaho.

The cumulative effect of cropping. Calif.

HORTICULTURE.

Apples.

Apple breeding. Iowa, Md.

Breeding experiments with apples. Va.

Apple breeding investigations. Idaho, Oreg.

Apple breeding to produce, if possible, varieties that will mature in Alaska. Alaska.

Breeding work with apples, for the purpose of studying the laws of inheritance in apples and of producing new types of fruit. Studies on self-sterility experiments on the mutual influence of stock and scion. Maine.

Hybridizing between standard varieties of apple and other species of the genus Malus, crossing between orchard varieties, crossing between strains of the same variety, and even between different individuals of the same strain. Ill.

Studies of apple bud selection. Ill.

Bud selection for increasing yield of apples. Missouri.

Bud selection and performance records with apples, grapes, small fruits. Mich.

An experiment to determine whether the apple can be improved by bud selection. N. Y. State.

Xenia in apples. Ark.

Causes and means of control of fruit bud formation on the apple. N. H.

Factors influencing the functioning of apple fruit spurs, with reference to biennial fruiting. Wis.

A histological study of the fruit branches of the apple. N. H.

Pollination of the apple and conditions affecting it. Oreg.

Pollination of the apple. W. Va.

Orchard stocks for the apple. Iowa.

Apple orchard experiment, selection and stocks. Penn.

Propagation of apple, sweet cherry, and walnut by pretreatment of scion wood in place. Penn.

Apples (Cont.)

Producing apple stocks by cuttings. Md.

The Siberian crab and other stocks for the apple to prevent the root-killing which is so often destructive to northern prairie orchards. S. Dak.

The growth of winter apples by top-grafting on hardy stock such as Virginia and other crab apples, and the Hibernial apple. S. Dak.

A study of the affinity between the apple scion and the pear stock. To ascertain if the pear root, which is immune to injury by the woolly aphis, is a suitable stock on which to bud or graft the apple. N. Mex.

Interrelation of stock and scion in apples. Mass.

Hardy stock for apples. Colo.

A test of different stocks for apples. N. Y. State.

Apple variety tests. Ala., Idaho., Md.

Apple variety tests, to sift them by testing and keeping the best. Alaska.

Variety tests of apples, plums, and small fruits. N. H.

New apples for Wisconsin. Wis.

Variety orchard of apples and miscellaneous tree fruits. Ky.

Variety work in pomology. N. C.

Apple orchard experiment with varieties. Penn.

Variety apple and peach orchard. W. Va.

Test of a number of new varieties of apples and of the one and two year old apple graft.--The testing of twenty new varieties of apples such as the Delicious, King David, Champion, Apple of Commerce, Stayman, Winesap, etc. To secure data on the longevity of these varieties upon very sandy soil. To ascertain whether the one-year-old or two-year-old apple graft is the better for planting under southern New Mexico conditions. N. Mex.

One and two-year-old tree test. Okla.

To determine the influence of environmental conditions upon different varieties of apples. Mass.

Studies concerning the variation in the internal structure of apples and pears as a means of indentifying varieties. N. Y. Cornell.

Apples (Cont.)

- Commercial value of dwarf apple trees. Va.
- A study of seedling apples in the State. Ohio.
- A special orchard for the study of seedling apples. Ohio.
- Method of apple orchard management in relation to soil moisture, soil temperature, tree development, and fruit production. Ind.
- Apple orchard experiment.--Cultural methods. Penn.
- Cultural methods on apples. Penn.
- Effect of various cover crops upon apple production. Del.
- Apple orchard experiment with cover crops. Penn.
- Physiological studies of apple trees under different cultural conditions and fertilizer treatments. Mich.
- Effect of fertilizers and orchard cultural systems upon color and maturity of Wealthy apples. Wis.
- Effect of pruning and nitrogen fertilizer upon the off-year production of Wealthy apple trees. Wis.
- Influence of fertilizers on yield and quality of apples; influence of cultural methods with and without fertilizers on yield and quality of apples. Penn.
- Fertilizers for apples and peaches. W. Va.
- Influence of fertilizer applications upon yield, growth, and other physiological functions of the apple grown in different soils. Penn.
- Influence of fertilizers on yield and quality of apples. Penn.
- To determine the effect of certain fertilizers upon the quantity and quality of apples, the fertilizers employed being manure, ashes, bone meal and muriate of potash, bone meal and low-grade sulphate of potash, bone meal muriate of potash and sulphate of magnesia. Bone meal and low-grade sulphate of potash. Mass.
- Humus and its relations to the physiological activities of the apple. Iowa.
- Apple orchard experiment with fertilizers. Penn.
- Fertilizers for apples. N. Y. State.
- Role of nitrogen, potash and phosphoric acid in apple production. Del.

Apples (Cont.)

- Top grafting experiments, designed to test the influence of stock upon scion in top-worked apple trees. Mass.
- Pruning apples, pears, and small fruits. Nebr.
- Pruning investigations with young apple trees. Ind.
- Pruning experiments with apples. N. J.
- Pruning the apple. Minn.
- Physiological effect of pruning apple trees. W. Va.
- Root pruning apples at planting. Wis.
- Experiment in thinning apples. Ala.
- Thinning apples. Mont.; W. Va.
- Soil-treatment and spraying experiments for apple orchards of central and southern Illinois. Ill.
- Dusting apple and peach trees for the control of insects and diseases. Md.
- Apple storage. Wash.
- The keeping qualities of apples in cold storage as affected by the health and vigor of trees. Calif.
- Cold storage for Iowa apples. Iowa.
- Cider and vinegar-making qualities of Minnesota apples. Minn.
- A histological and microchemical study of the normal apple during growth, maturation, and storage, with studies of the incidental changes in enzym content. Idaho.
- A study of factors involved in the ripening of fruit, particularly apples. Idaho.
- Relation of orchard practices to winter injury of apple trees. N. Y. State.
- Climatic injury with special reference to apple and other fruit trees. Wis.
- Disease resistance in apple trees. Ark.
- Resistance of apples and pears to Bacillus amylovorus. Tenn.
- Summer apple work. N. C.

Apples (Cont.)

Apples: Experiments and demonstration orchard at Lincoln Institute.
Ky.

Demonstration or experimental apple orchard. W. Va.

Apricots.

Apricots.--Variety tests. Ala.

Apricot pruning. Calif.

Asparagus.

Relation of size of seed to vigor of asparagus plants. Penn.

Relative value of seed from different portions of asparagus plant.
Penn.

A study of the relative value of growing asparagus by planting the seed where the plants are to mature, v. the usual method of transplanting one-year-old crowns. Penn.

A study of the comparative value of one-year v. two-year-old asparagus crowns at the time of transplanting. Penn.

Influence of size of asparagus crowns. Penn.

Yields from large and small one-year seedling asparagus plants. Ohio.

Yields of staminate and pistillate asparagus plants. N. Dak.

Plant food requirements of asparagus. Md.

To determine whether or not asparagus can be grown with profit on land of fertility suitable for the production of general farm crops. Penn.

The relative value of applying fertilizers at the time of planting asparagus. Penn.

A study of the comparative value of coarse salt v. nitrate of soda in the commercial production of asparagus and the effect of the time of application. Penn.

Best varieties of asparagus for yield, quality, and size of shoots.
Penn.

Value of asparagus seed selection for disease resistance. Penn.

Asparagus and rhubarb selection. Mich.

Beans.

Beans, st. Nebr. *For the purpose of determining the adaptability of the*

Variety study of beans. Ark.

Bean variety tests and selection to secure new and improved strains with special attention to the production of disease resisting varieties. Maine.

Variety test of beans to determine the adaptability of imported bean varieties to local conditions. P. R.

Variety test of beans to determine the varieties best adapted for planting in the State with special reference to their resistance to blight. Okla.

Bean tests, including navy beans, pinto beans, and soy beans. Nebr.

A comparison of different varieties of navy beans and other standard sorts with soy beans for yield of edible beans. Iowa.

Experiments with garden beans. Idaho.

Tepary, Mexican and string bean experiments. To obtain definite data on different methods of culture; to ascertain, if possible, the best date for planting; to test the different Mexican varieties and the tepary bean. N. Mex.

Bean breeding for interior dry land conditions in California. Calif.

Native beans of the southwest. Ariz.

Bean survey in western New York. N. Y. Cornell.

Cause and prevention of hardness and hardshell in beans. N. Y. State.

Experiments with canning white beans and peas. Idaho.

Blueberries.

Blueberry culture. Minn.

Culture test of blueberries to learn the best methods of growing. Alaska.

Blueberry culture as a possible new industry for Massachusetts, and as a possible substitute for cranberries on some bogs. Mass.

Study of the status of the blueberry industry in the State. N. H.

Breeding horticultural plants, general.

Fruit breeding. Nebr.

Breeding horticultural plants, general (Cont.)

Fruit and flower breeding. Mich.

Breeding of horticultural plants. Utah.

Improvement of hardy wild fruits of the northwest by breeding and crossing. S. Dak.

Fruit breeding, to evolve new fruits suited to Arkansas conditions. Ark.

Breeding and adaptation ^{to} of varieties of fruits suited to South Carolina conditions. S. C.

Breeding fruits of the genus Rubus. S. C.

Breeding orchids. N. Y. Cornell.

Cabbage, --- Cauliflower, collards, broccoli.

Experiments with cabbage. Idaho.

Cabbage experiments. N. C.

A study of the fertilizer requirement of cabbage and tomatoes. Penn.

Variety and strain test for cabbage. Ohio.

The relative value of varieties of late cabbage for different purposes. Penn.

Relative value of the most extensively grown varieties of cabbage. Penn.

Late cabbage: The relation of seed selection to size and solidity of heads, yield, and uniformity of type. Penn.

Early cabbage: The relation of seed selection to earliness, yield, and uniformity of type. Penn.

Experiments to determine the shrinkage in yields of cabbage as a result of attacks by the cabbage aphid and cost of spraying to secure efficient control. N. Y. State.

Breeding cabbage for disease resistance and general improvement. Ohio.

Cabbage seed selection for disease resistance. Missouri.

Improvement of Chinese cabbage by selection. Ohio.

Cabbage,--Cauliflower, collards, broccoli. (Cont.)

Experiment on storage pits and trenches for root crops and cabbage.
N. H.

Storage of cabbage.--Comparing storing in pits with and without roots
and good cellar storage. Mont.

A study of the root development of cabbage seedlings as influenced
by culture and environment to the final transplanting. Penn.

Suitability for some of the islands or points on the bay or the ocean
for the production of cabbage seed. Md.

Cauliflower studies. Oreg.

Collard breeding.--Breeding a better type of collard. Ga.

Experimental work in broccoli production.--Seed strain tests. Oreg.

Tests of shrinkage of broccoli following harvesting. Oreg.

Celery.

Celery investigations. Ky.

Experiments with celery: The influence of size of seed. Penn.

A study of factors which tend to induce premature seeding of celery.
Mont.

Cherries.

Cherry breeding investigation. Oreg.

A study of cherry pollination. Idaho.

Cherry, plum, and peach culture. Md.

Propagation of apple, sweet cherry, and walnut by pretreatment of
scion wood in place. Penn.

Cherry variety tests.--To select the hardier ones. Alaska.

Variety test of sweet and sour cherries and of European, native and
Japanese plums. To test a number of the newer varieties of these
different fruits. To ascertain why the sweet cherries are not
successful in New Mexico. N. Mex.

Stocks for sour cherries and plums. Mich.

The dying of cherries on certain stocks. Oreg.

A test of stock for cherries. N. Y. State.

Cherries (Cont.)

Cherry graftage.--To study the interrelations of stock and scion in cherry graftage. Vt.

Study of winter injury of cherry blossom buds. Wis.

Chili.

Improvement of Mexican chili by breeding and selection. N. Mex.

Citrus.

The breeding and improvement of citrus fruit. Calif.

Mulching of citrus trees with cane trash in old groves to conserve moisture and to supply humus. P. R.

The effect of different methods of culture, fertilizer treatment, and pruning upon the growth of citrus trees and the size and quality of fruit. Ariz.

The influence of soil environments, and treatment on stock and the quantity and quality of citrus fruits. To determine the influence of soil, environments and general treatment on stock and variety measured by the size and health of the tree and the quantity and quality of the fruit. P. R.

Experiment in the management of old citrus groves. Calif.

Fertilizer requirements of citrus trees at Riverside. Calif.

A physiological study of the effect of pruning upon the growth and productiveness of citrus trees and other horticultural plants grown under irrigation in arid regions in southern California. Calif.

The effect of different stocks on commercial species and varieties of citrus. Calif.

A study of the varieties of citrus fruits and their relatives. Calif.

The nematode problem on citrus trees. Calif.

Introduction of cultivated varieties of oranges to coffee plantations by rebudding native seedlings. To work over native seedling oranges in coffee plantations. To work fruit true to name, late varieties of good shipping qualities. P. R.

A study of cost accounting for citrus orchards, with a view to determining as far as possible the actual value of cultural practices. Calif.

Cost accounting in citrus groves to find the cost of producing citrus fruits in Porto Rico. P. R.

Citrus (Cont.)

Citrus survey. Calif.

Survey of situation of the citrus products and by-products industries in southern California. Calif.

Experiments in the fertilization of Satsuma trees that have been neglected and injured by freeze. Ala.

Grapefruit breeding.--To obtain a commercial variety of grapefruit resistant to citrus scab, P. R.

Observations and studies on internal decline of lemons. Calif.

Coffee.

Coffee fertilizers: To determine what fertilizers can be applied with profit to coffee plantations in Porto Rico. P. R.

Effect of nitrate of soda on coffee yields and comparison of same with sulphate of ammonia, to determine if sulphate of ammonia will be effective in increasing coffee yields where nitrate of soda has failed to do so. P. R.

Coffee variety tests, to find coffee of good flavor which may be more prolific or more resistant to insect attacks, disease or adverse conditions of soil or climate than is the coffee grown here at present. P. R.

The development of the coffee industry of the island. Guam.

Cranberries.

Cranberry bog management: General; effect of water as used in flowage-temperature at different seasons and depths, depth, chemical composition, drainage and irrigation, use of tile instead of open ditches; harvesting, technique of, management in its relation to the control of insects, management in relation to the control of fungus diseases. Mass.

Culture tests of cranberries to learn how best to grow them. Alaska.

Cranberry investigations. N. J.

Cranberry investigations: Submergence effects, etc. N. J.

Cranberry investigations: Soil water. N. J.

Cranberry investigations: Plant food. N. J.

Methods of weed control for cranberries. Oreg.

Cranberries (Cont.)

Investigation of cranberry bog weeds and their distribution. Mass

Cranberry varieties, their characteristics and possibilities of improvement by selection and crossing. Mass.

Weather observations and reports in connection with cranberry culture, including running of instruments, taking of readings, making of telegraphic reports to Boston daily, giving opinions to growers on frosty nights by telephone. Mass.

Study of chemical changes in cranberries during storage. Mass.

Cucumbers.

Cucumber experiments. N. C.

Improvement of greenhouse cucumbers by selection. Ohio

Improving greenhouse cucumbers by crossbreeding. N. Y. State.

Training experiments with cucumbers. N. Y. Cornell.

Currants.

Currant breeding to secure new varieties suited to the Alaska climate. Alaska.

Study of currants as to hardiness and fruitfulness. Wis.

Currant variety tests to find varieties best suited to Alaska. Alaska.

Studies on varieties of currants in an endeavor to standardize the nomenclature. Ohio.

A test of the varieties of currants offered for sale by nurserymen. Ohio.

Figs.

Table figs in California. Calif.

Figs, Smyrna and Capri.---Variety tests. Ala.

Capri figs and caprification in California. Calif.

Dried fig industry. Calif.

Floriculture.

Carnation breeding. N. H.

Breeding experiments with carnations. N. J.

Floriculture (Cont.)

Fertilizer experiments with carnations. Ill.

Influence of physical soil factors and of various chemicals upon growth of carnations. R. I.

Greenhouse projects:--A study of some of the causes of the bursting of the carnation calyx, with special reference to its inherited character. Md.

Breeding orchids. N. Y. Cornell.

Improvement of cineraria by selection. Ohio

Geranium varieties. Md.

Gladiolus studies: Investigations regarding the adaptation of different varieties to the soil and climatic conditions. N. Y. Cornell.

Iris studies: A collection on which to base studies of nomenclature as well as cultivation. N. Y. Cornell.

Peony studies: A collection of varieties for study and comparison regarding correct nomenclature. N. Y. Cornell.

Phlox studies, a study of the genus and of correct nomenclature. N. Y. Cornell.

The breeding of hardy roses for the prairie northwest, by crossing the Siberian and native roses with the choicest cultivated varieties. S. Dak.

Rose breeding (R. rugosa), to produce new varieties. Alaska.

Improving the rose by crossbreeding. N. Y. State.

Rose studies. A test garden to determine the hardiness of different varieties of cultivated roses under New York conditions. Studies on propagation, fertilization, and the pruning of roses to secure best results. N. Y. Cornell.

Studies with sweet peas to determine the transmission of such characters as size, type of foliage, flower color, flower form, color of seed, and shape of the pollen. Ill.

Sweet pea variety tests. Investigations on the preparation of soil for growing sweet peas both indoors and out of doors and in regard to the effect of sterilization of soils for growing indoor varieties. N. Y. Cornell.

Testing the difference between seed of the Spencer type of winter flowering sweet pea grown in the greenhouse and outdoors in California. Md.

Floriculture (Cont.)

How to get seed of the ten-weeks stock (Malthiola icana annua). to produce a large per cent of double flowers. Md.

An experiment to determine whether the violet can be improved by bud selection. N. Y. State.

Fruit bud studies.

An experiment to determine whether the apple can be improved by bud selection. N. Y. State.

Causes and means of control of fruit bud formation on the apple. N. H.

Pruning as a factor in bud formation and differentiation. Oreg.

Fruit bud formation investigations. Kans.

Fruit bud formation and development. Calif.

Fruit bud development of fruit trees as influenced by treatment and previous crops, to determine and record the behavior of individual fruit producing spurs and branches through a series of years, to determine factors favoring or opposing fruit bud formation on these parts as influenced by previous bearing, thinning fruit, pruning, tillage, girding, fertilizers, etc. Missouri.

Correlation of growth as found in bud development. N. Y. Cornell.

Studies concerning the nutrition of fruit buds and flowers. N. Y. Cornell

Effect of cultural operations and fertilizers in modifying the development of fruit buds and their resistance to extreme cold. Okla.

Effect of soil environment on fruit bud formation. Va.

Fruits. general.

Investigations with seedlings from fruits from selected trees to determine such differences as might appear between seedlings from large fruit as compared with those from small fruits. Ill.

Growing new seedlings. Ohio.

Hardy tree fruits for high altitudes. Colo.

Fruits and vegetables for high altitudes. Colo.

Native fruits of North Carolina. N. C.

Wild fruit plants of North Carolina. N. C.

Fruits, general (Cont.)

Root hardiness of fruit trees. Wis.

Smudging experiment to test a few of the different kinds of smudge pots, and to ascertain whether or not smudging is practicable. N. Mex.

Fruit tree injury from abnormal food supply. Mont.

Sterility of fruits. Minn.

Phenological fruit investigations to secure data on the blooming and ripening periods of the different orchard fruits. N. Mex.

Yield records of each tree in the orchards to determine cropping characteristics. Ohio.

A study of methods of propagating tree fruits from cuttings. N. Y. State.

Resistant native stocks for grafting. Ariz.

To determine the limits of budding and grafting and the factors which control these. Okla.

Factors influencing the set and development of fruit. N. Y. Cornell.

A study of the relative influence of different factors on the composition of certain fruits and nuts. Calif.

Fruit survey of Freemont County. Colo.

A study of the chemical composition of fruits during development under varying conditions of treatment. Del.

Frost injury. Temperature at which fruit buds are injured. Orchard heating. Utah.

Winter desiccation of fruit trees. Wash.

Winter injury investigations. Nebr.

A study of air drainage and spring temperature variations as affecting frost injury to fruit. N. Mex.

Critical temperatures of leading orchard fruits. Oreg.

Fruit tree nursery experiments. La.

Fruit trees and fruit bushes. Alaska.

Tree fruits. Mont.

Fruits, general (Cont.)

Variety testing of fruits. Iowa., Minn.

Variety trials, horticultural. N. Dak.

Variety test of fruit; to test the adaptability of many varieties to Massachusetts conditions. Mass.

Variety tests of various kinds. Ohio.

Variety studies: Type and varietal adaptation of fruits, vegetables, and ornamentals. Ariz.

Variety test of orchard fruit. To find varieties best suited to the State, particularly apples, peaches, and plums. Okla.

Varietal studies of tree fruits. Va.

Variety tests of fruit trees. W. Va.

Variety tests of fruits for drying. Calif.

Tree characters of fruit varieties. Mass.

A test of varieties of fruit for Imperial Valley. Calif.

A test of all varieties of fruits that will grow in the climate of New York. N. Y. State.

Variety orchard of apples and miscellaneous tree fruits. Ky.

Demonstration orchard and variety test of apples, plums, cherries, and pears at Bethany. W. Va.

Testing the adaptation of various plants introduced by the U. S. Department of Agriculture from foreign countries. S. C.

Fruit production, selection of hardy varieties. N. Dak.

A comparison of varieties of fruits in the study of the adaptation of varieties to different soil and climatic conditions. Ohio.

A study of fruit tree stocks, pruning, and planting methods. Calif.

Cost of producing fruits. Minn.

The ash of irrigated and non-irrigated fruits. Idaho.

Fruits, tropical and subtropical. (See also Citrus, Coffee, Figs.)

The avocado. Calif.

Fruits, tropical and subtropical. (Cont.)

A study of the native aguacate of Porto Rico, to find trees that produce good fruit of good shipping qualities and the distribution of bud-wood from the same. P. R.

Experiments with bananas and plantains to conduct variety, fertilizer, and other cultural experiments to determine the best varieties and methods of fertilizing and culture. Guam.

To assist in the development of the cacao industry of the island. Guam.

Cacao variation in yield, to determine extent of variation of individual cacao trees and factors affecting same. P. R.

Calomondin (Citrus mitis) variety tests. Ala.

Carica papaya variety tests. Ala.

Coconut experiments. To determine yields and quality of two leading strains or types of coconuts grown in Guam on different soil types; yields and value of different types; effect of fertilizers and careful cultivation on two leading strains or types of coconuts grown in Guam. Guam.

Coconut fertilization, to learn fertilizer requirements of coconuts on Porto Rico beach land. P. R..

Culture and management of date orchards, with special reference to the improvement of the yield and quality of fruit and the rooting of off-shoots. Ariz.

To produce by crossing, selection and inbreeding, a variety of dates of high quality which will ripen naturally under Arizona conditions. Ariz.

Feijoa variety tests. Ala.

Guava variety tests. Ala.

Jujube fruits: Adaptability to the southwest. Ariz.

To acquire, test, and disseminate better varieties of mangos than those grown locally. P. R.

Sapota variety tests. Ala.

Vanilla shading and fertilizer tests; to determine the effect of very heavy as contrasted with very light shading and also the effect of fertilizers on growth and production of vanilla. P. R.

Effect of limitation of production on size of vanilla beans and on subsequent crops. P. R.

Fruits, tropical and subtropical (Cont.)

Tropical fruit investigations, to secure a greater variety of desirable fruits for growing in Guam. Guam.

Breeding investigations with tropical horticultural plants, to determine methods of breeding best adapted to each species under consideration and to develop new and desirable forms. Hawaii.

The cold storage of certain semi-tropical fruits. Calif.

Variety and cultural tests with tropical fruits and vegetables, to determine the relative merits of various varieties of different species of tropical fruits and also to determine the best cultural treatment for species in question. Hawaii.

Gooseberries.

Gooseberry breeding. The production of hardy varieties suited to the country. Alaska.

Gooseberry variety tests. To find the varieties best suited to Alaska. Alaska.

Gooseberry experiments, with reference to mildew-resisting powers. Wis.

Grapes.

Grape breeding. Md.

Studies of transmission of characters in hybrids of Rotundifolia grapes. N. C.

Improvement of bearing of vine varieties by selection. Calif.

Vineyard and orchard fertilization experiments. N. Y. State.

Fertilizers for grapes. N. Y. State.

Effect of the use of various fertilizers on a vineyard growing in a well-balanced soil. Calif.

Grape variety tests. Ala., Mich.

Variety and cultural study of grapes. Ark.

Tests of new or little known varieties of vines. Calif.

Bud selection and performance records with grapes, apples, and small fruits. Mich.

Varieties of grapes best suited for the State. Okla.

Grapes (Cont.)

Testing European grapes for American conditions. N. Y. State.

Test of Vinifera grapes under Maryland conditions. Md.

A study of grapes, Vitis vinifera, compared to native or V. champinii varieties. Tex.

Stump system v. trellis experiment with grapes, to investigate which of the two systems is the more expensive and which will produce the larger yield, and to develop a practical and economical method of banking up the vines grown according to the trellis system. N. Mex.

Grape trellis and training experiments. Md.

Best arrangement and pruning of vines in a muscat vineyard. Calif.

Effects of summer pruning on the quantity and quality of the crop on the vigor of the vine. Calif.

Grape spraying. Mich.

Relation of the number of vines per acre to the quantity and quality of the crop. Calif.

The effect of frost on vines and methods of control. Calif.

Seasonal activities of vine varieties. Calif.

Demonstration of method of growing raisin grapes. Calif.

Table grapes for the San Joaquin Valley. Calif.

Wine grapes for the San Joaquin Valley. Calif.

Relation of degree of maturity of grapes to quantity and quality of raisins. Calif.

A study of the rooting habit of grape vines under irrigation in the different soil types in Imperial Valley. Calif.

Grafting Delaware grape on various stocks. Md.

Resistant stocks for raisin varieties. Calif.

Resistant stocks for Californian vines. Calif.

Testing stocks for European and American grapes. N. Y. State.

A test of stocks for grapes. N. Y. State.

Irrigation ^{of} vineyards. Calif.

Grapes (Cont.)

Vineyard investigations. Iowa.

Grape investigations. Ky.

Grape experiments. W. Va.

Grape and scuppernon vineyard experiments. La.

Muscadine grape work. H. C.

The utilization of the muscadine grape. S. C.

An experimental study of the possible length of the storage period of a selected lot of table grapes and the optimum temperature at which the fruit should be held. Calif.

Greenhouse soils, management and treatment.

Sterilization of soil with sodium cyanid to destroy insects, parasitic fungi, and weed seed. Calif.

Summer treatment of greenhouse soils. Ohio.

The effects of heating soils on germination and plant growth and the development of diseases in heated soils which have become reinfested. Wis.

Commercial fertilizers on greenhouse soils. Ohio.

Juneberries.

Juneberry tests, to see if any can be grown. Alaska.

Lettuce.

Lettuce breeding experiments. Ill.

The development of superior strains of Grand Rapids lettuce. Ohio.

Variety tests of lettuce. Calif.

Strain tests with lettuce and tomatoes in the greenhouse. N. Y. Cornell.

Culture and improvement of head lettuce. Ohio.

Head lettuce investigations. Ky.

A study of the effects of certain fertilizer treatments on lettuce and tomatoes under glass. Penn.

A study of various combinations of soil, rotted manure, and sand, with reference to their effect on lettuce production in the greenhouse. Ill.

Loganberries.

Loganberry variety tests. Ala.

Melons.

Watermelon breeding for resistance to Fusarium wilt. N. C.

Improving the muskmelon by crossbreeding. N. Y. State.

Cantaloup experiments. N. C.

Mulberries.

A study of certain mulberries with reference to fruit production, the quality of fruit, and its possible use in the home or in the yard. Ariz.

Nectarines.

Nectarine variety tests. Ala.

Nuts.

Propagation of apple, walnut, and sweet cherry by pretreatment of scion wood in place. Penn.

Nut investigations. N. C.

Nut culture. Md.

Nut culture in Minnesota. Minn.

Nut variety trials. Oreg.

Almond variety tests. Ala.

Almond culture. Calif.

Butternut variety tests. Ala.

Chesnut variety tests. Ala.

Litchi investigations. To secure data on the best methods of cultivation and marketing of the litchi. Hawaii.

Pecan work. N. C.

Pecan investigation, to test the better varieties of pecans to see if some cannot be found which will prove hardy in this part of Oklahoma. Okla.

Pecan breeding work. N. C.

Nuts (Cont.)

Variety tests with pecans. Ga.

Pecan culture in California. Calif.

Self-sterility in varieties of *Hicoria pecan*. Ga.

Pecan, English walnut, and almond experiment, to ascertain whether New Mexico climatic and soil conditions are suitable for the growing of these nut trees, to study the different methods of preventing winter injury to the trees, and an investigation on originating if possible, a late blooming almond. N. Mex.

Pistachio variety tests. Ala.

To determine the practicability of growing pistach trees and nut trees in the southwest. Ariz.

Walnut breeding investigations. Calif.

Walnut variety tests. Ala.

Walnut pollination. Oreg.

Field trials of fertilizers and green manure crops with walnuts. Calif.

Walnut root stock investigations. Calif.

A study of evaporation of walnuts. Oreg.

Walnut-oak hybrids. Study of a new form of *Juglans californica*. Teratology in *Juglans californica*. Calif.

Sunburning and winterkilling of walnut trees. Calif.

Off-year production.

Effect of pruning and nitrogen fertilizer upon the off-year production of Wealthy apple trees. Wis.

Factors influencing the functioning of apple fruit spurs, with reference to biennial fruiting. Wis.

Olives.

Olive variety tests. Ala.

The effect of different methods of olive orchard management and pruning upon the growth of tree and yield. Ariz.

Investigation of the pickling of ripe and green olives, including a study of the oil content of immature and mature olives. Calif.

Olives (Cont.)

Preparation of collection of olive trees at Davis, Kearney, and Imperial, and of specimens at Berkeley. Calif.

Onions.

Variety tests of onions. Calif.

Onion seed production studies. Ind.

Strain tests, Red Wethersfield and Yellow Danvers onions. Wis.

A physiological study of onion dormancy. W. Va.

Orchard management, fertilizers, culture.

Orchard management investigations. Iowa.

Orchard management: to test effect of summer pruning; a comparison of trees symmetrically headed-in year after year with trees not pruned; a comparison of one and two year apple trees for setting; to determine the relative value under Massachusetts conditions of southern as compared with northern grown stock. Mass.

Experiment in the management of old groves at Arlington Heights Grove. Calif.

Experimental orchards at several points in the State for the study of spraying, fertilizing and soil management. Va.

Cooperative orchard management. Minn.

Orchard tillage: Sod, clean cultivation, mulch, combined cultivation and cover crops. Missouri.

Methods of orchard culture. Ohio.

Orchard cover crops. Ind., Mich., Wash.

Various plants as cover crops and their effects on the growth of fruit trees. Mass.

(Tillage v. cover crops.) N. Y. Cornell.

The effect of sod mulch on nitrogen supply and other factors that influence the growth of fruit trees. N. Y. Cornell.

Intercrops for deciduous orchards. Calif.

A test of mulches for orchard trees. Calif.

Effect of tillage practices on soil moisture content and growth of trees. Calif.

Orchard management, fertilizers, culture (Cont.)

Orchard fertilizer experiments. Ala.

Orchard fertilizers. Iowa, Mich.

Orchard fertilization. Wis.

Direct feeding of nitrates to trees by the method of irrigation.
Oreg.

Experiments on the use of nitrate of soda on orchard trees. Ala.

Orchard and vineyard fertilization experiments. N. Y. State.

Problems concerning the response of small fruits and young trees
to fertilizers. N. Y. Cornell.

Irrigation of orchards and small fruits. Calif.

Planting distances for deciduous orchard trees. Calif.

Growing nursery stock. To produce Alaska grown trees for test in
various parts of the territory. Alaska.

Use of dynamite in tree planting. Wis.

Renovation of prune orchards. Wash.

Growth and other orchard notes. Growth, yield and other data on
apple trees. Maine.

Orchard demonstration work. N. C.

Orchard and field demonstration work. N. C.

Demonstration of experimental orchard. W. Va.

Maintaining an orchard for the testing of fruit trees, obtained
through the office of Foreign Seed and Plant Introduction, U. S.
Department of Agriculture. Tex.

Ornamentals and hedge plants

Variety studies: Type and varietal adaptation of ornamentals, veg-
etables, and fruits. Ariz.

Variety tests of ornamentals, including shrubs, trees, perennials,
and annuals. S. Dak.

Tamarisks for growing in alkaline soils. Ariz.

Ornamental shrubbery tests, to study their behavior. Alaska.

Ornamentals and hedge plants (Cont.)

Test of varieties of ornamental annuals. Alaska.

Study of ornamental varieties and their uses. Minn.

Tests of ornamental trees and shrubs. Mont.

A test of hedge plants. S. Dak.

A study of trees and shrubs suitable for ornamentation, windbreak, and shade at Prescott and Cochise Dry Farms, Tempe, Date Palm Orchard, and University Farm, Tucson. Ariz.

Tree planting for ornamentation and for windbreaks. N. Dak.

Ornamental perennials tests. Alaska.

New plant materials for landscape use in Iowa. To collect reliable data on plant material regarding their landscape value under Iowa conditions. To test on the station grounds new and little known plant materials. Iowa.

Peaches.

Peach work. N. C.

Peach orchard experiments to secure data on cost of production, yields of varieties, different ways of pruning, and longevity of the different varieties. N. Mex.

Peach and apple orchard experiments. La.

Peach breeding. Ill., Mass., N. J.

Peach breeding for hardy sorts. Missouri.

Crossbreeding peaches, with reference to improved fruits, improved root stocks, and study of inheritance in Amygdalus. Calif.

Peach, plum, and cherry culture. Md.

Fertilizer experiments with peaches. Ga., N. J.

Fertilizers for peaches and apples. W. Va.

Influence of fertilizers on peach production. Penn.

Functions of nitrogen, potash, and phosphoric acid in the production of the peach. Del.

Dusting peach and apple trees for the control of insects and diseases. Md.

Peaches (Cont.)

Investigations on spraying peaches. Ill.

Pruning experiments with peaches. N. J.

Variety tests with peaches. Ga.

Variety peach and apple orchard. W. Va.

Study with peaches on change of permeability and its relation to availability. Del.

The longevity and adaptability of the Indian cling peach. A comparison of the longevity of the modern commercial varieties of peach when budded on to the Indian Cling stock y. the same variety on stock from the mixed seed obtained on the market: To test the Indian Cling seedlings as to heredity or stability of character, and as direct fruit producers. Tex.

A study of some factors influencing the hardiness of the peach. Md.

Local variations of climate in relation to the peach crop. Mass.

Pears.

Pear breeding. Md.

Breeding pears immune to blight. S. Dak.

Breeding pears for resistance to pear blight. Ga.

Pear harvesting and storing investigations. Oreg.

Pear growing in eastern Colorado. Colo.

Variety pollination experiment with pears. A variety test of 78 varieties to test their relative resistance to the pear blight, and to study the degree of self-sterility or self-fertility. N. Mex.

A study of the comparative keeping qualities of different varieties of pears in cold storage. Calif.

Studies concerning the variation in the internal structure of apples and pears as a means of identifying varieties. N. Y. Cornell.

A study of the affinity between the apple scion and the pear stock. To ascertain if the pear root, which is immune to injury by the woolly aphis, is a suitable stock on which to bud or graft the apple. N. Mex.

Pruning pears, apples, and small fruits. Nebr.

Peas.

Variety tests of garden peas. Calif.

Varietal experiments with field and garden peas. Idaho.

Experiments with canning peas and white beans. Idaho.

Peppers.

Commercial experiments with bell peppers. La.

Persimmons.

Development of fruit in persimmon and pawpaw. Md.

The Kaki or oriental persimmon in California. Calif.

Plums.

Plum, peach, and cherry culture. Md.

Variety test of European, native, and Japanese plums and sweet and sour cherries. To test a number of the newer varieties of these different fruits. N. Mex.

Variety tests of plums, apples, and small fruits. N. H.

Plum variety tests to see if any will mature fruit. Alaska.

Variety plum orchard. W. Va.

A test of stocks for plums. N. Y. State.

A study of plum stocks. S. Dak.

Stocks for plums and sour cherries. Mich.

The pollination of Domestica and Triflora plums under California conditions. Calif.

Plum studies. Wis.

Pollination studies.

Pollination studies. Calif.

Pollination of the apple. W. Va.

Pollination of the apple and conditions affecting it. Oreg.

Orchard pollination. Tests of sterility of varieties of apples and influence of insect pollination and of the development of pollen tubes and process of fertilization in self-pollinated and cross-pollinated blossoms. Wash.

Pollination studied (Cont.)

A study of cherry pollination. Idaho.

Prunes.

Prune studies. Calif.

Prune variety tests. Ala.

Time and method of tillage studies with the prune. Oreg.

Nitrate studies of Italian prune orchards. Oreg.

Complete fertilizer studies with the prune. Oreg.

Lime studies with the prune. Oreg.

Graft union overgrowths on prune nursery stock. Oreg.

Renovation of prune orchards. Wash.

Pruning.

A physiological study of the effect of pruning upon the growth and productiveness of citrus trees and other horticultural plants grown under irrigation in arid regions in southern California. Calif.

Physiological effect of pruning fruit trees. W. Va.

Physiological effect of pruning apple trees. W. Va.

Effect of pruning and nitrogen fertilizer upon the off-year production of Wealthy apple trees. Wis.

Pruning experiment, to study the effect of different times and styles of pruning. N. Mex.

Dressings for pruning wounds. Mich.

Healing of pruning wounds. Mont.

A study of various methods and times of pruning tree and vine fruits. N. Y. State.

Summer y. winter pruning experiments. Idaho.

Pruning investigations with young apple trees. Ind.

Root pruning apples at planting. Wis.

Pruning apples, pears, and small fruits. Nebr.

Pruning (Cont.)

Problems concerning the response of fruit trees to pruning.
N. Y. Cornell.

Comparison of the effects of long and short pruning on varieties
which are commonly pruned both ways. Calif.

Pruning as a factor in bud formation and differentiation. Oreg.

Pruning the apple. Minn.

Pruning experiments with apples. N. J.

Quinces.

Quince variety test. Ala.

Test of quince varieties. Md.

Raspberries.

Raspberry breeding to produce new and better varieties. Alaska.

Breeding work with the dewberry and raspberry. Tex.

Raspberry variety tests, to test them out to find the best sorts.
Alaska.

Rhubarb

Rhubarb experiments. La.

Rhubarb and asparagus selection. Mich.

The development of an improved variety of rhubarb. Penn.

Small fruits.

Small fruits experiment. Idaho.

Small fruit experiment, to collect phenological data on a number of
different varieties of strawberries, blackberries, raspberries,
currants, and loganberries, and to ascertain, if possible, the best
varieties of these different fruits for commercial and home
plantations. N. Mex.

Bush fruit experiments. W. Va.

Small fruit tests, to learn what small fruits can be grown and how
best to grow them. Alaska.

Bush fruits. To test some of the most popular varieties of bush
fruits and strawberries. Okla.

Small fruits (Cont.)

- Small fruit and garden crops investigations. Kans.
- Variety tests of small fruits and vegetables. Mich.
- Variety test of bush fruit. Md.
- Variety tests of small fruit. Mont.
- Variety tests of small fruits, plums, and apples. N. H.
- Variety tests and breeding work with small fruits, especially strawberries and raspberries. Maine.
- Bud selection and performance records with small fruits, grapes, and apples. Mich.
- Propagation and selection of small wild fruits, to find desirable plants of red raspberries and red currants. Alaska.
- Pruning small fruits, pears, and apples. Nebr.
- Nitrate and fertilizer investigations with small fruits. Oreg.
- Problems concerning the response of small fruits and young trees to fertilizers. N. Y. Cornell.
- Small fruit survey. W. Va.

Spinach.

- Spinach studies. Oreg.
- A study of spinach as a market garden crop for southern Arizona. Ariz.
- Spraying, dusting, and fumigating. (See also Chemistry--Chemical studies, Diseases of Plants--Fungicides, and Economic Entomology--Insecticides)
- Soil treatment and spraying experiments for apple orchards of central and southern. Illinois. Ill.
- Fungicides and spraying investigations. Oreg.
- Effect of long-time spraying of orchards. Ohio.
- Tests of relative efficiency of different spray solutions in controlling orchard insects and diseases. S. C.
- Dormant sprays. Ark.
- Dusting v. spraying. Ind.

Spraying, dusting and fumigating (Cont.)

- Spraying apple trees while in bloom. Its effect upon bees. Ind.
- Spray experiments in Nebraska. Apples, pear, grapes, and bush fruits. Nebr.
- Dusting and spraying apples. Mich.
- Comparison of dusting and spraying for the control of insects and diseases on the apple. W. Va.
- Spraying and dusting for codling moth and apple scab. Va.
- Dusting v. spraying for control of apple diseases. N. Y. State.
- Dusting peach and apple trees for the control of insects and diseases. Md.
- Investigations on spraying peaches. Ill.
- Peach spraying for control of curculio and associated insects and diseases. N. C.
- Orchard spraying experiments. Ala.
- Orchard spraying experiments at Highmoor, to obtain light on the fungicidal action of the arsenate of lead in controlling apple scab. Maine.
- Orchard spraying demonstrations. N. C.
- Testing new spray materials. Mass.
- Test of spraying materials. Mich.
- Tests of dust sprays. Ill.
- Chemical investigation of spray materials. Oreg.
- A survey of the waters of the Santa Clara to determine their fitness for making oil emulsions. Calif.
- The solubility of calcium and magnesium arsenates when used for spraying purposes. Mich.
- A study of the fumigation process with special reference to the chemical problems involved. Calif.
- A test of spray nozzles. W. Va.
- Toxic action of fungicides on parasitic fungi. N. H.
- Physiological reaction of plants to light intensity and moisture in relation to burning of foliage by sprays and fumigants. Mass.

Spraying, dusting and fumigating. (Cont.)

Physiological effects of arsenical compounds on vegetation. Mont.

The stimulating effect of Bordeaux mixture on plants, especially the potato plant. Vt.

Why and under what conditions do arsenicals burn foliage? Mass.

Why insecticides burn foliage. Tests of various insecticides to find the value of materials sent in for trials. Mass.

Squash.

Studies of heredity in vegetables, especially squashes and tomatoes. N. H.

Quality and quantity studies with squash. A study of the internal factors which govern quantity and quality in squash production. Vt.

Stock and scion investigation.

Orchard stocks for the apple. Iowa.

A test of different stocks for apples. N. Y. State.

Producing apple stocks by cuttings. Md.

Top grafting experiments, designed to test the influence of stock upon scion in top-worked apple trees. Mass.

Experiments on the mutual relation of stock and scion. Maine.

A study of the affinity between the apple scion and the pear stock. To ascertain if the pear root, which is immune to injury by the woolly aphid is a suitable stock on which to bud or graft the apple. N. Mex.

Scion selection. A study of the relationship of the parentage of scions to subsequent fruitage; of the question whether scions from high-bearing, low bearing, and constant bearing trees will perpetuate these characteristics or whether they will be modified by the characteristics of the tree into which they are grafted. Vt.

Interrelation of stock and scion in apples. Mass.

Stock and scion investigations. Ind.

To determine the influence, if any, of the stock on season of ripening, color, and quality of the fruit produced by the scion. Mass.

Storage studies.

Storage experiments. Mich.

Cold storage investigations. Ky.

Cold storage for Iowa apples. Iowa.

Freezing experiments in connection with storage studies. Mich.

A demonstration and study of the effect of degree or stage of ripeness of fruit at picking upon its behavior in cold storage. Calif.

Strawberries.

Strawberry experiments. N. C.

Strawberry variety tests. Idaho, Wis.

Strawberry experiments, including variety test, bud variation, and strawberry culture. W. Va.

Testing new variety strawberries. Md.

Strawberry variety tests to test and select the best varieties. Alaska

Strawberry breeding, variety trials, and cultural experiments. Ky.

Strawberry breeding to secure varieties that shall be suited to the Alaska climate: Particularly in point of hardiness. Alaska.

Improvement of the strawberry by crossing and selection. Ohio.

Sterility of strawberries. Causes and remedies. Vt.

Strawberry runner selection. A study in improvement in yield by stolen selection on the basis of parental yields. Vt.

Methods of growing strawberries. Md.

Sweet corn.

Sweet corn investigation. Iowa.

Early green corn experiments. N. C.

Sweet corn breeding. Iowa.

Breeding sweet corn suitable for the South. Ga.

Improvement of yield, quality, and uniformity of sweet corn. Wis.

Sweet corn improvement. Ind.

Sweet corn (Cont.)

Work with sweet corn. Variety tests and selection to secure new and improved strains. Maine.

Sugar corn seed production and breeding. Md.

Metabolism studies with sweet corn. Md.

Tomatoes.

Experiments with tomatoes. Idaho.

Tomato investigations. Ky.

Cooperative tomato investigations. Missouri.

Tomato experiments. To try the different methods of producing early tomatoes; to test a number of representative varieties of the early and late ripening kinds; to try different cultural methods. N. Mex.

Tomato breeding. Wis.

Breeding tomatoes for disease resistance and for general improvement. Ohio.

Trial of first-generation crosses of tomatoes in the greenhouse. Ohio.

Propagation of disease-resistant strains of tomato. Ohio.

Improving the tomato by crossbreeding with special reference to securing better varieties for canners. N. Y. State.

Improvement of greenhouse tomatoes by crossing and selection. Ohio.

Studies of heredity in vegetables, especially squashes and tomatoes. N. H.

Tomato seed improvement. Ind.

Seed selection of tomatoes. Mont.

Development of a wilt resistant greenhouse tomato. Ind.

The introduction of a wilt resistant tomato. Ala.

Tomato pollination studies. Oreg.

Factors affecting setting of fruit on the tomato. Okla.

Fertilizer experiments with tomatoes. N. J.

Fertilizers for cannery tomatoes. Ind.

Tomatoes (Cont.)

A study of the effects of certain fertilizer treatments on tomatoes and lettuce under glass. Penn.

Fertilizer treatments of tomatoes, with special reference to the production of dwarf plants, with short internodes, during the warm part of the fall months. Md.

Tomato varieties. Oreg.

Tomatoes: The relative merits of varieties for different purposes. Penn.

Tomato varieties and selection for early production. N. Dak.

A test of commercial varieties of tomatoes to determine their relative resistance to Fusarium wilt. Ill.

Variety strain test of early tomatoes. Ohio.

Variety and strain testing of canning tomatoes. Ohio.

Adaptation of varieties of tomatoes to New Hampshire conditions. N. H.

Testing varieties of tomatoes on stakes. Ohio.

Strain tests with tomatoes and lettuce in the greenhouse. N. Y. Cornell.

Tomato plant introduction studies. Ind.

Tomatoes: Influence of seed selection. Penn.

Utilization of tomato waste from canning factories. Ark.

Vegetables and truck crops, general.

Garden vegetables demonstrations. Guam.

Miscellaneous vegetable trials. Ky.

To ascertain most suited and profitable varieties of northern and native vegetables. P. R.

Miscellaneous vegetables under glass, including spinach, Swiss chard, cauliflower, and French endive. Oreg.

Breeding experiments with vegetables, to obtain varieties of vegetables adapted to Porto Rican conditions and of good quality and yield. P. R.

Breeding and selection of vegetables. Minn.

Vegetables and truck crops, general (Cont.)

Studies of heredity in vegetables, especially squashes and tomatoes.
N. H.

The production of more suitable kinds of some of the more important vegetables, by crossing and selection. Also acclimatization and adaptability by growing the plants to the seeding stage under local conditions. Md.

Selections to develop varieties of canning vegetables. Mich.

Variety tests of vegetables. Idaho.

Variety tests of vegetables. To see what can be grown. Alaska.

Variety tests of vegetables. To find the varieties best suited to that State. Okla.

Variety tests of vegetables. Confined chiefly to beans, cabbage, cauliflower, and sweet corn. Mont.

Variety testing of novelties, or apparently worthy kinds of the most important vegetables. Md.

Tests of varieties of certain vegetables and of green manures for market gardeners. Conn. State.

A study of some of the leading vegetables, including the study of new types. S. Dak.

Variety studies: Type and varietal adaptation of fruits, vegetables, and ornamentals. Ariz.

Variety tests of vegetables and small fruits. Mich.

Vegetables under irrigation, including tomatoes and string beans. Oreg.

Straw mulch, cultivation for nonirrigated gardens. Mont.

Transplanting investigations with vegetables. Missouri.

Fertilizer experiments with tomatoes, sweet potatoes, and muskmelons to determine the fertilizer needs of these crops in a three-year rotation. Ill.

A study of the fertilizer requirements of cabbage, tomatoes, and potatoes on Dekalb soils. Penn.

Fertilizer and green manure experiments for various trucking crops. Tenn.

Vegetables and truck crops, general (Cont.)

The manurial requirements of vegetables grown in the field and greenhouse. R. I.

Cover crops and manure for truck crops. Ohio.

Truck gardens at two county experiment farms in which experiments are in progress in the use of fertilizers, manures, and cover crops. Ohio.

Tests of composition and fertilization of greenhouse crops. Ind.

Truck crop rotations. N. C.

Production of vegetables on marsh peat. Wis.

French endive studies. Oreg.

Swiss chard studies. Oreg.

Preliminary experiments with various garden seed crops. ^{Idaho} Iowa

Mushroom culture. W. Va.

Canning crops. Utah.

Vegetable gardening. N. Dak.

A study of seed production of garden crops. Ga.

Vegetable seed growing to produce Alaska grown seed for use of the station and to ascertain if commercial seed growing will be possible. Alaska.

Intertillage experiments with vegetables. N. Y. Cornell.

Garden crop and small fruit investigations. Kans.

The suitability of Garrett County for the production of cool-climate vegetables during the summer. Md.

The practicability of growing vegetables on the University Farm. Calif.

Vegetable irrigation at Davis. Calif.

Detailed study of vegetable garden work at the Agnew State Hospital. Calif.

The rancher's home garden. Calif.

Soil fertility studies from the standpoint of the vegetable grower. Md.

Vegetables and truck crops, general (Cont.)

Effects of chemicals used as supplements to stable manure on garden crops, viz, nitrate of soda, acid phosphate, and sulphate of potash, with special reference to character of growth and early maturity. Mass.

Experiment in the use of manures, commercial fertilizers and green crops for maintaining soil fertility in vegetable gardens. N. H.

Winter injury.

Climatic injury with special reference to apple and other fruit trees. Wis.

Relation of orchards practices to winter injury of apple trees. N. Y. State.

Studies of injuries from winter freezing of younger orchards of apple, peach, and plum. Ohio.

Miscellaneous.

Thermal work. N. C.

Relative fruitfulness of canes originating on two-year-old wood (fruit canes) and canes originating on older wood ("water sprouts" and "suckers"). Calif.

Tests of composition and fertilization of greenhouse crops. Ind.

A study of the chemical composition of fruits during development under varying conditions of treatment. Del.

Growing of trees and plants of economic or ornamental value for distribution, native and foreign. P. R.

Time of planting and distribution of acreage of 8 food crops of Porto Rico, with a view to increase the planting and production of food crops in Porto Rico. P. R.

Bud selection and performance records with apples, grapes, and small fruits. Mich.

Utilization of horticultural products. Utah.

Nursery plantings of trees and shrubs. Ky.

Horticultural survey of the State. Utah.

SEEDS AND SEED TESTING.

Miscellaneous.

Seed studies. Minn.

Seed analysis. Wash.

Distribution of seed. Wash.

Analyses and germination tests of collected samples. Md.

Examination of seeds for purity and germination. Ohio.

Seed testing. Minn.

Seed testing. A comparison of different methods of making germination tests both as regards efficiency and accuracy. Iowa.

Seed testing. The improvement of methods and of equipment used in making germination and purity tests of seeds. Iowa.

The determination of viability of seeds by electrical methods. Mich.

The promotion of seed production. Mich.

Cooperative seed production and distribution. Minn.

The etiology of the "water sprouts" in germinating seeds. N. Y. State.

Cost of producing clean seeds. Idaho.

Weeds found in seed sent in by Iowa farmers. Iowa.

Seed investigations, including study of "hard seeds" of some clovers, and germination of weed seeds. Iowa.

Including the improvement of germination of hard seeds of legumes and a study of seed laboratory records relative to the fixation of grades of small seeds. Oreg.

Seed testing. A study of hard seed of legumes. Iowa.

Influence of form and amount of sulphur on growth and development of seed and of sulphur loving plants. Wis.

Preliminary tests of different fertilizing substances and mixtures on seeds. Ky.

WEEDS.

Miscellaneous.

Weeds. Minn.

Weeds, miscellaneous (Cont.)

Weed seed cases. Minn.

Weeds found in seed sent in by Iowa farmers. Iowa.

Germination of weed seeds. Iowa.

Investigation on weeds in relation to cost of producing clean seed.
Idaho.

Spraying for weeds. Wash.

Irrigation water as a disseminator of weed seeds. Colo.

Weed survey. Idaho

Study of methods of weed eradication. Wis.

Eradication of quack grass. Penn.

Eradication of Canada thistles. Penn.

Tests of chemical means and cultural means for the control of wild
morning glory (Convolvulus arvensis). Calif.

Nut grass eradication. Ala.

Experiments on the eradication of Johnson grass by kudzu. La.

To determine a practical method of eradicating Johnson grass. N. Mex.

FORESTRY.

Basket willows

Basket willow test, to determine the best variety of commercial willow
for Oklahoma. Okla.

Basket willow culture and propagation. To introduce them and study
their behavior. Alaska.

Investigations relative to the production of willow withes to be
used in furniture and other manufactures. Mich.

Forest arboretums.

Forest arboretums. Testing the adaptability of trees to different
soils and in different mixtures. Ohio.

Maintaining an arboretum for testing of forest trees for ornament,
shade, windbreak, and building purposes. Tex.

Forest management.

Management of the native woodlot and regeneration of the planted woodlot. Iowa.

Thinning experiments with catalpa. Experiments in the improvements and reconstruction of the native woodlot. Studies of the management of the beach-maple woodlot. Ohio.

Woodlot management. Penn.

Maple sugar and sirup. (See agrotechny)

Reforestation.

Reforestation studies. Methods of planting forest trees. A comparison between cleft and hole planting on different soils, and experiments on direct seeding. Ohio.

Reforestation experiments at the Coast Station. S. C.

Studies in forest regeneration. Minn.

The reforesting with useful trees, a tract of 200 acres denuded by charcoal burners. P. R.

Tree planting, experimental.

Experimental tree planting. Idaho, Kans.

Experimental forest plantings. Penn.

Forest plantings, including hardy catalpa planting on upland soil, hardy catalpa planting on land subject to overflow, underplanting slow growing native hardwoods and white pine, walnut planting on bottom lands, the utilization of wet lands for catalpa production, cottonwood planting on islands and lowlands, reforestation of waste lands with evergreen trees, forest nursery, and basket willow experiments. Iowa.

Wood, studies of.

Wood collection. Minn.

Wood utilization. Ohio.

Studies in the decay of wood. Colo.

Determination of moisture content of different woods under various conditions and their adaptability for special purposes. Penn.

Investigation of sources of supply of certain woods in New York State, with special reference to those needed in war time. N. Y. Cornell.

Forestry, miscellaneous.

A study of the changes in plant structure due to eccentric growth.
The determination of tree temperatures. Vt.

Forest^{re} production. A study of the underlying principles governing
the natural reproduction of forest growth. Vt.

Field observations in forestry. Penn.

Variety tests of coniferous and deciduous trees. S. Dak.

Foreign tree introductions. Penn.

Studies in adaptability and rate of growth of trees at the Santa
Monica Forestry Station. Calif.

Studies in adaptability and rate of growth of trees at the Chico
Forestry Station. Calif.

Operations on the Waterloo and Dean State forests. Ohio.

Phenological forestry observations. Penn.

Preparation of a manual of the trees, wild and cultivated, grown in
Maryland. Md.

Propagation of junipers and cedar from cuttings. Mich.

A study of tolerance of forest trees. Vt.

Municipal forestry. Ohio.

The propagation of forest trees, including fertilization and control
of fungi. Ohio.

Fixation of sand dunes by tree plantings. Mich.

Investigations in forest products. Iowa.

The relation of soil types to forest trees. Iowa.

Sylviculture studies at Itasca Park. Minn.

Working plan for Itasca Park. Minn.

Experiments in immature white pine stands. N. H.

Experiments in establishing artificial forests of different species
in New Hampshire. N. H.

A study of the development of stands of Sequoia gigantea. Calif.

The morphology and germination of forest trees. Iowa.

Forestry, miscellaneous (Cont.)

A study of the growth and yield of various species of Eucalyptus on different sites in California. Calif.

Prepsration of volume tables for principal California species. Calif.

The introduction and propagation of forest and shade trees for various regions of Texas. Tex.

Commercial tree studies, including cottonwood, white pine, European larch, and hardwoods for Iowa. Iowa.

A study of trees suitable for windbreak planting on various sites in California. Calif.

Study of growth and yield of forest trees in New York State, including studies at Nehasane Park, and establishment of permanent sample plats at Newcomb. N. Y. Cornell.

Hardwood factor studies. The determination of farm factors ^{for} ~~for~~ growing birch, beech, and maple, with a view of securing data which will make estimates of such timber while standing more likely to be accurate. Vt.

Growing trees for fence posts. To determine what varieties of trees are best adapted to post, pole, and shade purposes. Okla.

Shingle experiment. Penn.

Lasting qualities of western red cedar shingles nailed with different kinds and number of nails. Penn.

Factors affecting the cost of log making and skidding. Redwood region and Sierra Pine region. Calif.

A forestry and farm management survey of northern Minnesota. Minn.

DISEASES OF PLANTS.

Alfalfa diseases.

Occurrence and injuries from diseases of alfalfa and clovers. Ohio.

Study of an alfalfa disease. La.

Apple diseases.

Apple and lettuce diseases. N. C.

Apple disease control. Ark.

Dusting and spraying for apple scab and codling moth. Va.

Apple diseases (Cont.)

apple blister canker. Nebr.

Blister canker of apple trees and its control. N. Y. State.

Relation of water content of apple branches to the parasitism of blister canker fungus, Nannularia discreta. N. Y. State

Investigations for the control of the blister canker of the apple. Iowa.

Studies in the black rot of apples. Penn.

Black root rot of the apple. Va.

Root rot of apples in Delaware and their control. Del.

Studies of the apple blotch. Penn.

A test of spray control measures for apple blotch disease and tests of apple sprays. Ohio.

Collar-rot of apples. Penn., W. Va.

Apple ring rot. Ark.

Measles disease of apples. Ark.

"Smallpox" bark disease of apple branches. Ohio.

Apple rust. Penn., W. Va.

The relation of insects to the development and spread of the blight organism in apples and pears. Ohio.

Cold storage diseases of apples. Ohio.

Apple leaf diseases. W. Va.

Apricot diseases.

A study of apricot gummosis and its control. Calif.

Armillaria mellea.

A study of Armillaria mellea, with the purpose of finding practicable ways to put an end to loss from this fungus among the trees and shrubs attacked by it. Calif.

Avocado diseases.

Avocado and citrus diseases. Fla.

Barberry diseases.

A verticillium disease of the cultivated barberry. Ohio.

Bean diseases.

Investigation relating to bean diseases. Mich.

Bean disease investigations, especially the nature and control of root rot, anthracnose, and bacterial blight. N. Y. Cornell.

To study the principal diseases of beans in the State and to perfect methods of control. Okla.

Studies on the bacterial blight of beans. N. Y. State.

Investigations on nature and cause of bean mosaic. N. Y. Cornell.

Bean diseases with special reference to mosaic. Oreg.

Bean rust. Ind.

Experimental spraying of beans for control of anthracnose. Mass.

Botrytis diseases.

Studies on botrytis diseases. N. Y. Cornell.

Cabbage diseases.

Cabbage disease investigations. Ind.

Investigations on diseases of cabbage, pickles, and potatoes. N. Y. Cornell.

Control of club root. Penn.

Club root of cabbage and allied plants. A study of disease resistance and of soil treatment. Vt.

Investigation of the cause and control of black rot, yellows, and black-leg of cabbage. Wis.

Testing of yellows resistant selection of cabbage and tomatoes resistant to Fusarium wilt. Ohio.

Cabbage yellows. To determine which of the early varieties are most immune to this disease, the degree of injury as correlated with the time of planting, the value of what is known in the trade as "frost proof cabbage" as a means of controlling the yellows, breeding resistant strains, cabbage seed bed diseases and control, relation of other diseases to yellows. Iowa.

Control of cabbage yellows. Iowa.

Celery diseases.

Investigations on diseases of truck crops, particularly celery, lettuce, and onions. N. Y. Connell.

Investigations relating to celery diseases. Mich.

Experimental spraying of celery for late blight control. Mass.

Cereal diseases, general.

Cereal diseases investigations. Kans.

Cereal and forage crop diseases. Minn.

Diseases of wheat, oats, rye. Special percentage count of diseases of wheat and oats; tests of methods of seed treatment of wheat; anthracnose disease of cereals. Barberry eradication. Field trips to locate new diseases of wheat. Ohio.

A bacterial disease of cereals. Ark.

Bacterial diseases of grain, grasses, and soy beans, and their control. Wis.

Cereal rusts. Ark.

Rust investigations. Ind.

Rust of cereals. Minn.

Investigations on grain rust. Wis.

Cereal leaf rust investigation. Ind.

Stem rust investigations. Oreg.

Stem rust of cereals. Ind.

Stripe rust investigations. Oreg.

Rust life cycle studies. Ind.

Rusts. Life history and cultural methods. Ind.

A systematic and physiological study of rusts, to determine the occurrence and distribution of rust in the vicinity of Columbia, and the relation of grain rusts to different varieties, including a study of physiological specialization, rust resistance, and the inheritance or noninheritance of rust resistance. Missouri

A study of the cereal rust situation in the South. Ala.

Cereal diseases, general (Cont.)

Oat rust investigations. Iowa.

Barberry eradication. N. Dak.

Smut investigations. N. Dak.

Grain smut investigations. Oreg.

Grain smuts investigation and control. To determine the influence of moisture content of soil, composition of soil, and temperature of soil, with reference to organic matter, etc., on the entrance of smuts of cereals Missouri.

A cereal smut survey. Ala.

The smuts of barley and soy beans. Ohio.

Proso millet smut. Colo.

Oat smut. Wash.

A study of improved methods of treating seed oats for smut. Iowa.

Sorghum smuts and methods of control. Okla.

Wheat smuts. Methods of control. Seed treatment. To determine the cause of, and possible methods of controlling various forms of smut explosions and the possibility of catching and destroying a large percentage of the smut at the threshing machine in an effort to reduce the amount of soil contamination. Wash.

The relation of soil moisture content to bunt or stinking smut infection in wheat. Idaho.

Inheritance of stem rust resistance of wheat. N. Dak.

Life history and relations of imperfect fungi to soil and seed in wheat cropping. N. Dak.

Investigations of seed treatment and seed injury to cereals. Oreg.

Diseases of barley in Wisconsin caused by Helminthosporium. Wis.

Cherry diseases.

Leaf spot of cherry and plum and its control. Wis.

A bacterial disease of the Wragg cherry. Colo.

Citrus diseases.

Citrus and avocado diseases. Fla.

Citrus canker. Ala.

Citrus scab. To study the habits and control of the citrus scab fungus. P. R.

Investigation as to the causes, manner of development, and treatment of gum diseases of citrus and other fruit trees. Calif.

Root disease of citrus trees. Calif.

Observations and studies on internal decline of lemons. Calif.

Clover diseases.

Occurrence and injuries from diseases of clovers and alfalfa. Ohio.

A study of the clover crown rot or eel worm disease. Idaho.

Mosaic of clovers. Ark.

Coconut diseases.

Coconut stem disease. To determine the cause, distinctive symptoms, and control of the disease. P. R.

Coffee diseases.

To study the cause of a root disease of coffee and the control of the Stillbella leaf spot. P. R.

Stillbella flavida control in coffee. To find a practical means of controlling or destroying Stillbella. P. R.

Corn diseases.

Corn disease investigations. Ind.

Black mold of ear corn. Tex.

Field studies of the occurrence and losses from corn root rot. Ohio.

Fusarium diseases of corn. Iowa.

Root, stalk, and ear rots of corn. Ind.

Investigations of "Frenching" diseases of corn, together with methods of control for same. Ky.

Cotton diseases.

Cotton anthracnose studies. N. C.

A study of cotton anthracnose. S. C.

Cotton wilt. La.

Wilt resistant cotton. Ark.

A study of the bacterial diseases of cotton. S. C.

Cranberry diseases.

Cranberry fungus enemies. N. J.

Fungus diseases of the cranberry from a technical standpoint. Testing of sprays for control of fungus diseases. Studies of cranberry storage and shipping conditions. A study of bog management in this connection. Mass.

Crown gall.

Crown gall investigations. Iowa.

Crown gall experiments. Oreg.

Study of the comparative infectiousness of the crown gall organism (Bacterium tumefaciens), with special reference to finding resistant forms of prunes suitable as a root stock for the various stone fruits. Calif.

Effect of crown gall and nematode on growing apple trees. Ga.

Cucumber diseases.

Investigation of cucumber diseases. Mich.

Investigations of certain cucumber diseases. Ind.

Cucumber diseases and their control. Wis.

Studies of the cucumber mildew. W. Va.

Eggplant diseases.

Eggplant blight and rot. La.

Ergots.

Ergot of paspalum. Ark.

Forest and shade tree diseases.

Dendropathological work. Minn.

A root rot of white pine, possible associated with an autophytic fungus. Ohio.

A branch disease of white pine and other evergreens. Ohio.

White pine blister rust control. Minn.

Studies of the botanical relations and channels of infection of the white pine blister rust. Conn. State.

The control of the white pine blister rust on Ribes. N. H.

Blister rust of conifers. Penn.

A new disease of the tulip poplar in the nursery of the forestry department caused by a Verticillium. Ohio.

An unidentified root rot and a sclerotial leaf disease of the catalpa. Ohio.

Detection and eradication of chestnut bark disease. N. C.

Damping-off of coniferous seedlings. Minn.

Fruit diseases.

Fruit diseases; Minn.

Fruit rot investigations. To determine the causes of loss in citrus fruits and pineapples exported from Porto Rico. P. R.

Fruit spots and stains. Calif.

Studies of fruit rotting Sclerotinia. Md.

Fruit tree diseases.

Investigation of brown bark spot disease of fruit trees. Mont.

Heart rots of fruit trees. Oreg.

Root and bark diseases of fruit trees. Oreg.

The relation of insects to the transmission of fire blight. Ohio.

Fungicides. (See also Economic Entomology, Insecticides.)

Analysis of fungicides and insecticides. Wash.

Various tests of fungicides and insecticides. Conn. State.

Fusarial diseases.

A study of certain Fusarial diseases of plants. Missouri.

Grape diseases.

Utility of Winter spraying in the control of vine mildew. Calif.

Grass diseases.

Bacterial diseases of grasses, grain, and soy beans, and their control.
Wis.

Investigation of a fungus disease of lawn grass. Mass.

Lettuce diseases.

Investigations on diseases of truck crops, particularly lettuce, celery,
and onions. N. Y. Cornell.

Lettuce and apple diseases. N. C.

Lettuce diseases experiments. N. C.

Prevention of lettuce diseases by sterilizing soil with formaldehyde.
Mass.

Melon diseases.

Diseases of the watermelon and their control in Texas. Tex.

Study of bacterial wilt, soil wilt and leaf spot of watermelons,
cantaloups, and cucumbers. Del.

Monilia blight.

Monilia blight. Oreg.

Mosaic diseases. (See also Specific crops.)

A detailed study of mosaic of plants. Ga.

Several mosaic diseases of plants in connection with etiologic studies.
N. Y. Cornell.

Mycosphaerella

Life histories and classification of the fungus genus Mycosphaerella.
Md.

Olive diseases.

A study of the bacterial diseases of olives known as olive knot, with
the purpose of discovering the method of dissemination of causative
organism and the conditions governing infection. The perfecting of

Olive diseases (Cont.)

a practical method of control or eradication and study of the pathological changes connected with the knot formation. Calif.

Onion diseases.

Investigations on diseases of truck crops, particularly onions, celery, and lettuce. N. Y. Cornell.

Onion disease investigations. Ind.

Onion diseases and their control. Wis.

Investigation of pink root of onions. Tex.

Onion smut control investigations. Oreg.

Black neck rot and smut of onions, and a new black mold of onions in storage. Ohio.

Investigation of rots of stored onions. Mass.

Pea diseases.

Investigations of pea blight. Wis.

An inquiry into some of the soil, fertilizer and crop rotation conditions that may induce or aggravate the wilt disease of the garden pea. Md.

Root rot of peas. To determine the causes and to select strains resistant to the disease. Md.

Peach diseases.

Studies of peach yellows. N. J.

Special observations on peach yellows. Conn. State.

Study of the cause of little peach, peach yellows, or rosettes. Del.

Investigations of brown rot of peach with special attention to blossom blight. N. J.

Peach diseases. Utah.

Observations on peach diseases as affected by different fertilizers. Conn. State.

June dry of peaches. Del.

Peanut diseases.

Study of peanut diseases. N. C.

Pear diseases.

The relation of insects to the development and spread of the blight organism in pear and apples. Ohio.

Breeding pears for resistance to pear blight. Ga.

Breeding pears immune to blight. S. Dak.

Investigation on the control of pear blight. Ill.

Pepper diseases.

Disease of the chili pepper. N. Mex.

Sclerotium wilt of the pepper. La.

Investigation of fruit rot of peppers. Ga.

Pineapple diseases.

Investigation of the pineapple wilt. Fla.

Plant disease survey.

Plant disease survey. Ark., Ind., Mass., Minn., N. C., S. C., Tex., Wash.

Plant disease survey of the State. Ohio.

Plant disease survey of Virginia. Va.

Plant disease survey of the State, with special reference to the potato wart disease. Conn. State.

Plant disease survey, special attention being given to diseases of the sugar beet. Utah.

Plant disease survey, including fire blight, apple scab, bean mosaic, cherry gummosis, peach leaf curl, pear canker, potato wilt, prune "drought spot", heart rot, western or yellow blight of tomato, miscellaneous diseases. Oreg.

Plant disease survey work. Penn.

Potato diseases, Irish.

Potato diseases. Utah, Wis.

Potato and garden truck diseases. Minn.

Investigations on diseases of potatoes, cabbage, and pickles. N. Y. Cornell.

Potato diseases, Irish (Cont.)

Potato disease work at Highmoor, including mosaic, net necrosis and spindling sprout, and Rhizoctonia resistance. Maine.

Irish potato diseases and storage. Tex.

Studies of physiological diseases of potatoes. N. J.

Potato diseases and seed potato disease examination. Ohio.

Detailed experiments in seed treatment and spraying potatoes. Ohio.

Seed treatment of Irish potatoes. Ark.

Potato diseases in relation to seed and crop production. Iowa.

Seed potato treatment for control of black scurf. Penn.

An investigation of species of *Fusarium* in relation to field wilt and rotting of potato tubers. Mont.

A study of *Fusarium* wilt in potatoes. N. Dak.

Potato wilt. Maine.

Dry storage rot of potatoes caused by *Fusarium coeruleum*. Oreg.

Verticillium wilt of potatoes. Oreg.

Investigations of black leg and other diseases of the potato. Mich.

The potato wart diseases and its control. Penn.

Experiments on the control of mosaic by roguing and hill selection.

Studies on the transmission of the disease, the effect of different fertilizing ingredients or the addition of different substances to the soil, on mosaic disease. Maine.

Mosaic disease of potatoes. An attempt to determine the possibility of detecting the presence of mosaic by the inspection of the seed. Vt.

Potato diseases, especially mosaic, leaf roll, etc. Experiments on the control of mosaic by roguing and hill selection. Studies in the transmission of the disease. The effect of different fertilizing ingredients or the addition of different substances to the soil on mosaic disease. Maine.

Preliminary studies on the cause, distribution, and importance of leaf roll, mosaic disease, net necrosis, and similar troubles of potatoes in Maine. Maine.

Potato leaf roll. Its cause, and control by selection. Maine.

Potato diseases, Irish (Cont.)

Communicability of leaf roll of potato. Penn.

A study of leaf curl, leaf roll, rosette, and related diseases of the potato plant. Nebr.

Potato disease investigations, particularly upon the nature and control of leaf roll and mosaic. N. Y. Cornell.

Rhizoctonia disease of potatoes. Maine.

A study of the life history and parasitism of Rhizoctonia as related to Irish potato diseases. Nebr.

Comparison of the value of seed selection and seed treatment for the control of the Rhizoctonia disease of potato. Idaho.

The potato scab. Vt.

Deep scab of potatoes. Ark.

Etiology of potato scab in Nebraska. Nebr.

The apple leaf hopper in relation to tip burn of potatoes. N. Y. State.

Spindling sprout disease of the potato tuber. Md.

Little potato diseases. Mont.

"Streak" and minor potato diseases. Maine.

Rhizoctonia disease.

Rhizoctonia disease. Wash.

Rhubarb diseases.

A rhubarb disease. Penn.

Rice diseases.

A study of rice diseases. La.

Root knot.

Root knot control. Ark.

Control of nematode root knot. Fla.

Root rot diseases.

Root rot diseases of New Mexico crops, to obtain information as to the cause, nature, and control of these diseases. N. Mex.

Root rot diseases. (Cont.)

Texas root rot investigations. Tex.

A study of the Texas root rot fungus. Ariz.

Sclerotium rolfsii.

Investigations into the life history and parasitism of Sclerotium rolfsii. Ga.

Seeds as disease carriers, treatment etc. (See also Diseases of specific crops.)

Seeds as carriers of bacterial and fungus plant diseases. N. Y. State.

Control of plant diseases by treating seed with active chlorin. Ark.

To find diseases that are carried in the seed, and means of disinfecting seed carrying parasitic diseases, and to study the trouble due to immaturity. Md.

Small fruits, diseases of.

Diseases of small fruits, especially raspberries and blackberries. Ohio.

Orange rust of blackberries. Ind.

Soy bean diseases.

Etiology of a bacterial disease of soy beans. N. C.

Bacterial diseases of soy beans, grasses, and grain, and their control. Wis.

Spinach diseases.

Relation of aphids to spinach blight. Va.

Stone fruits, diseases of.

Special studies of the bark disease organism of stone fruits. Ohio.

Gummosis of stone fruit trees. Occurrence, causes and methods of control of this disease. Ariz.

Identification and life history studies of fungi attacking date fruits. Ariz.

Sugar beet diseases.

Investigations on the curly top disease of the sugar beet. Calif.

Sugar cane diseases.

A study of sugar cane diseases. La.

To determine if insects transmit mottling disease in sugar cane, and if so, what insects. P. R.

Sweet potato diseases.

Sweet potato diseases and storage. Tex.

Mosaic of sweet potatoes. Ark.

Sweet potato black heart. Ark.

Investigation of the rot diseases of the sweet potato. Del.

Varieties of sweet potatoes best suited to the section and also a study of the control of various diseases. Okla.

Tobacco diseases.

Investigation of the "shed burn" of tobacco. Wis.

Investigations of "must" of tobacco. Wis.

A study of leaf spot diseases of tobacco. Wis.

Investigation of the Fusarium root rot of tobacco. Wis.

Investigation of the Fusarium wilt of tobacco. Wis.

Investigation of the root rot disease caused by Thielavia, including development of Wisconsin strains of tobacco resistant to root rot, development of root rot resistant White Burley tobacco for Kentucky and other districts, relation of rotation of host plants and nonhost plants of Thielavia on the severity of the Thielavia root rot disease of tobacco, and inheritance of disease resistance in tobacco to the root rot disease caused by Thielavia. Wis.

A study of tobacco root rot in Georgia. Ga.

The steaming of tobacco beds for the prevention of root rot. Ohio.

Leaf spot of tobacco. Va.

Tobacco wilt control. N. C.

Etiology of tobacco speck disease or frog-eye. N. C.

A study of so-called tobacco sickness and tobacco sick soils. Mass.

Influence of fertilizer on leaf diseases of tobacco. N. C.

Tomato diseases.

Tomato diseases. Va., W. Va.

Tomato disease investigations. Ind.

Tomato wilt. La.

The Fusarium wilt of tomatoes. Ga.

Resistance of tomato to Fusarium wilt. Tenn.

Tomato wilt diseases and soil sterilization of plant beds and greenhouses, Selection of resistant strains of tomato plants. Ohio.

Investigation of the cause or causes of wilt disease of tomato and selection of resistant strains. Tenn.

Fusarium wilt resistant tomatoes. To secure strains of canning tomatoes that will yield well on land infected with the wilt fungus prevalent in Maryland. Md.

Wilt resistance of tomatoes. Ark.

Tomato breeding for disease resistance. Del.

Development of a wilt resistant greenhouse tomato. Ind.

The introduction of a wilt resistant tomato. Ala.

Tomato bacterial spot or canker. Ind.

Control of leaf blight of tomato. To devise practical methods for controlling Septoria leaf blight of tomato under field conditions. Md.

Studies upon the Septoria leaf spot of tomatoes. Penn.

Control of Septoria leaf spot of tomato. Ind.

Tomato mosaic control. Ind.

Studies on the canker disease of tomatoes. Penn.

Tomato blight. Md.

Winter blight of tomatoes. Penn.

Tomato blight and related diseases. Wash.

A study of western tomato blight. Idaho.

Tomato diseases with special reference to the so-called western blight. Oreg.

Tomato diseases (Cont.)

Tomato spraying for control of fungus diseases. Del.

Investigations on the diseases of canners' crops, particularly the end rot and blight of tomatoes. N. Y. Cornell.

Testing of yellows resistant selection of tomatoes and cabbage resistant to Fusarium wilt. Ohio.

Vanilla diseases.

To determine the cause and control of the serious diseases of vanilla in Porto Rico. P. R.

Vegetable diseases, general.

Diseases of vegetables and garden crops. To collect data on the distribution severity and control of diseases of the common vegetable and garden crops. P. R.

Canning crop diseases, especially Rhizoctonia on the tomato. Methods for its control. Diseases occurring in hot bed with methods for their treatment. Utah.

Investigations on the diseases of canners' crops, particularly the end rot and blight of tomatoes. N. Y. Cornell.

Studies of diseases of certain truck crops caused by Sclerotinia and Botrytis. Penn.

Investigations on diseases of pickles, cabbage, and potatoes. N. Y. Cornell.

Investigations on diseases of truck crops, particularly lettuce, celery, and onions. N. Y. Cornell.

A study of certain truck crop and seed bed diseases. Fla.

Walnut diseases.

The control or avoidance of walnut blight. Calif.

Walnut blight, investigation for control. Calif.

Miscellaneous.

Miscellaneous plant disease investigations. Kans.

Miscellaneous plant pathological investigations. Oreg.

Miscellaneous notes on plant diseases, Ill., N. Y. State.

Diseases of plants, miscellaneous (Cont.)

Miscellaneous diseases of trees and crops. Iowa.

Studies of new and noteworthy plant diseases. Ill.

Minor pathological problems. Mich.

Minor investigations in plant pathology. Calif.

Study of plant pathogenes from the point of view of their biological characteristics. Mich.

Experimental investigations of those diseases which are at present resulting in the most serious loss to the grower, more especially carnation "yellows", the Fusarium wilt of carnations, snap dragon rust, and aster "yellows". Ill.

Routine examination of material sent to the citrus experiment station and minor studies in mycology and bacteriology. Calif.

The influence of soil temperature upon seedling infection with fungus or bacterial parasites. Wis.

Mycological investigations. Taxonomic work. Cytological investigations. Groups of fungi containing important phytopathogens are receiving most consideration. N. Y. Cornell.

Fungus disease investigations. Colo.

Chlorosis troubles. To ascertain the best method of restoring the usual green color of trees and vines affected with chlorosis. N. Mex.

Identification laboratory. To identify samples of weeds, poisonous plants, ornamentals, trees, wild plants, mushrooms, and diagnose plant diseases. Md.

Investigation of plant diseases in Hawaii. To identify the principal plant diseases and develop methods for their control. Hawaii.

Snapdragon rust and its control. N. H.

Nutrition of orchard and small fruits in relation to resistance to disease. Missouri.

Dipping nursery stock in copper sulphate. Calif.

Studies of plant nutrition with reference to physiological diseases. Fla.

The relation of insects to the transmission of fire blight. Ohio.

The biochemistry of disease resistance in plants. Minn.

ECONOMIC ZOOLOGY.

Bird pests.

Crow control. Okla.

Crawfish.

A systematic and biologic study of the crawfish of Mississippi, with special reference to species injurious to agriculture, and to the means of controlling them. Miss.

Earthworms.

Earthworm investigations. Mont.

Nematodes.

Control of nematode root knot. Fla.

Root knot control. Ark.

The nematode problem on citrus trees. Calif.

Investigation of the root-knot nematode and its relation to various host plants. Ga.

Rodents and other mammal pests.

Injurious mammal investigations. Kans.

The natural history of the lowland marmot. Wash.

Rodent pests. Utah.

Campaign against injurious field rodents. Minn.

Destructiveness of ground squirrels. Wash.

Field mice and other rodents. Minn.

Effect of rodents upon grazing ranges, with special reference to the jack rabbit and kangaroo rat. Ariz.

House rat control and rat campaign. Minn.

Slugs.

The garden slug. Oreg.

(See also Veterinary Medicine. For Mites and red spiders, see Entomology.)

ECONOMIC ENTOMOLOGY

Alfalfa insects. (See also specific and Field crop insects.)

Alfalfa insects. Calif.

Insects injurious to alfalfa. Kans., Nev.

Insects attacking alfalfa and clover. Va.

Alfalfa seed insects. Utah.

The alfalfa weevil. Utah.

Investigations on a snout beetle of alfalfa. Mich.

A study of the grasshopper pest to determine the eating capacity of grasshoppers in alfalfa fields and observations on their feeding habits with reference to the use of poisoned baits. Ariz.

Ants.

The control of the Argentine ant in sugar cane fields. La.

Ants of Colorado and their relation to the Aphididae. Colo.

Aphids. (See also insects of specific plants.)

Aphid investigations. Maine.

Investigations on plant lice. Colo.

Investigations on plant lice ravages. Mich.

Ecological and life history studies of Aphididae, with special reference to the alternate food plants of migratory species. Maine.

Orchard insect investigations.--Plant lice. N.J.

Vegetable insects investigations.--Plant lice. N.J.

Biochemical, morphological, and systematic study of aphids. Tex.

Control of woolly aphis. Va.

Control of green aphis in bearing orchards. N.Y. State.

Life history work with Leucopis griseola, an important enemy of various aphids. La.

Laundry soap in water as remedy for aphis. N.C.

Ants of Colorado and their relation to the Aphididae. Colo.

Apple insects. (See also specific insects.)

The control of the codling moth and other apple insects. Ark.

Codling moth. N.J.

The lesser apple worm. Ark.

The apple leaf roller. Utah.

The leaf rollers and fruit worms of apple and pear. Oreg.

An investigation of the life history, habits, and control of the bud moth (Tmetocera cellana Schiff). Penn.

An investigation of the apple leaf miner and its relation to applications of contact insecticides. N.H.

Bionomics and control of the apple leaf skeletonizer and the bearing of the data obtained on other related species. Md.

An investigation of the life histories and habits of two late summer apple pests, together with a consideration of the means of control. N.Y. Cornell.

Control of apple and peach tree borers. W.Va.

An investigation of aphids injurious to apples. Field spray tests, the biology and habits of aphids as influenced by atmospheric conditions and their effect on the prevalence and activities. A study of host relationship. Oreg.

The rosy aphid in relation to abnormal apple structures. N.Y. State.

Apple woolly aphid. Ark.

Woolly apple-aphid control. W.Va.

The apple leaf hopper in relation to tip burn of potatoes. N.Y. State.

Bean insects. (See also specific and Truck crop insects.)

An extended investigation of the pests attacking beans. To determine the pests responsible for injuries to the bean crop in New York State, to become acquainted with the life histories and habits of these pests, to determine the amount of damage they inflict and to find methods of control. N.Y. Cornell.

Bees.

Bee investigations. Kans.

Apiary. Minn.

Bees. Oreg.

Bees (Cont.).

Apiculture. --To develop an experiment station apiary to ascertain the best type of bees for Oklahoma, the value of bees in the fertilization of alfalfa. Okla.

Honey bees. Utah.

Honey bees. To encourage the bee industry by demonstrating methods and appliances for handling bees; rearing and distributing queen bees, investigate methods of increase and to keep record of honey production. Guam.

Increasing honey production. Ark.

The combless packages of bees. Iowa.

Queen raising. Minn.

Artificial fertilization of queen bees. Okla.

The relation of tongue length and body size to the production of honey. Iowa.

A study of the nutrition of the honey bee. Minn.

To effect greater production of honey per colony. To determine the amount of increase in honey production by building up colonies previous to honey flows by judicious manipulation of brood. P.R.

To effect greater production of bees wax. To determine amount of increase in wax production by practicing certain manipulation of comb, supers and brood chambers, during certain seasons of the year, using checks for comparison. P.R.

Honey plant investigations. Iowa.

Bee and honey survey of Minnesota. Minn.

Bee disease inspection in the University Farm beekeeping locality. Minn.

Foul brood eradication and control. Tex.

Honey bee paralysis. To ascertain the life history, food plants, and methods of control. Okla.

Dying bees. Wash.

Bacterial flora of the intestinal tract of the honey bee. Iowa.

Spraying apple trees while in bloom. Its effect upon bees. Ind.

Bees (Cont.).

Time and labor factors involved in gathering, ripening, and storing honey by honey bees. Iowa.

Summer and winter scale records of colonies of bees. Minn.

Total reproduction and comparative reproduction of Carnolian and Italian queen bees. Okla.

Winter protection of bees. Md.

Study of proper conditions for bee cellars. Wis.

Methods of protecting bees from sudden changes in temperature. S.C.

Meteorological influence on honey production. Iowa.

Maintenance of bees in greenhouses. Md.

Pollination of agricultural and horticultural crops by honey bees. Minn.

Beetles. (See also Weevils and specific crops.)

Annotated list of the Halticini of College Park and vicinity, to identify and list the flea beetles and study their food plants. Md.

White grub investigations. Iowa.

Life history work with Phyllotreta aeneicollis and Colaspis brunnea. La.

Coleoptera.--Ecological and life history studies of Maine species of economic importance, with a view to remedial measures where injurious species are concerned. Maine.

Cabbage insects. (See also specific and Truck crop insects.)

Experiments for the control of lepidopterous larvae attacking cabbage. La.

Experiments to determine the shrinkage in yields of cabbage as a result of attacks by the cabbage aphid and cost of spraying to secure efficient control. N.Y. State.

Cane insects. (See also specific and Field crop insects.)

The investigation of sugar cane insects, especially the sugar cane borer. La.

Control of white grubs in cane cultivation. To control ravages of white soil grubs in sugar cane cultivation. Virgin Islands.

Cane insects (Cont.).

To determine insect pests of sugar cane, cotton, corn, and truck crops, together with a miscellaneous collection of insects from the island. Virgin Islands.

To determine if insects transmit mottling disease in sugar cane, and if so, what insects. P.R.

A study of the mealy bug and its attacks on sugar cane, and rearing a species of lady beetle obtained from California, which attacks this species, for distribution to plantations. La.

The control of the Argentine ant in sugar cane fields. La.

Cicada.

Distribution of periodical cicada. Ohio.

Citrus insects. (See also specific insects.)

Citrus insects. Ala.

Control of the citrophilus mealy bug. Calif.

Parasites of the white fly in relation to reasons for immunity or nonimmunity to the insect, physiological effect of the insect and its fungi on the citrus tree and effect of various insecticidal remedies on the tree. Fla.

Clover insects. (See also specific and Field crop insects.)

Insects attacking clover and alfalfa. Va.

A study of insects injurious to clover. To study the life histories, distribution, injuries, and habits of the insects affecting clover, to obtain data on which to base methods of control. N.Y. Cornell.

Studies on the life history of the clover leaf tyer. Ohio.

A study of clover aphid and methods for its control. Idaho.

Codling moth.

The codling moth. Wash.

Codling moth studies. Colo.

Studies of the life history and habits of the codling moth. Ind.

A study of the life cycle of the codling moth and the best time and method of applying insecticides for controlling it. To ascertain if it is possible to improve the present methods of controlling the codling moth. Missouri.

Codling moth (Cont.).

Studies on the life history of the codling moth. Ohio.

Investigations of the life history of the codling moth in New Mexico. N. Mex.

Study of the number of broods of the codling moth to determine the presence and importance of the second brood and whether it is necessary for it. Mass.

Cooperative band records of the codling moth in Santa Fe County with county agent. To determine the number of broods of codling moth in the high altitude. N. Mex.

Investigations of codling moth, particularly with reference to control measures. Wis.

Testing new spray materials for the control of the codling moth. Idaho.

Codling moth. Times of spraying as compared with times indicated by isophanes. Mich.

The codling moth. Improved spray practices, new combination sprays and better technique. Oreg.

Coffee insects.

Investigations of minor coffee pests. To determine importance of various insects known to occur on coffee. P.R.

Study of coffee leaf miner. To find practical control measures, and to judge value of parasites in the coffee. P.R.

Coffee shade tree insects. To determine importance of insects found on coffee shade trees and to find practical remedies for injurious ones. P.R.

Corn insects. (See also specific and Field crop insects.)

Insects attacking corn, cotton, and tobacco. Va.

Insect investigations. To determine insect pests of corn, cotton, sugar cane, and truck crops, together with a miscellaneous collection of insects from the island. Virgin Islands.

Corn insect control. Ala.

Corn stalk borer (Distraea saccharalis). N.C.

A study of the life history, distribution, and means of control of the new corn borer. Iowa.

Corn insects (Cont.).

Seed corn maggot. N.J.

Investigation of the rice weevil attacking corn. Ala.

The corn plant louse. Okla.

Bionomics and control of the corn root aphid. Md.

Corn ear worm investigations. Kans.

The life history and habits of the corn ear worm. Ky.

An investigation to determine the life history, development and habits of the corn ear worm and practical methods of controlling its ravages. To find some means of preventing this pest from injuring field and sweet corn. It feeds on a wide variety of plants but its main injury is on corn. The old method of fall plowing is not entirely effective and the attempt is made to find some treatment of corn ears which will keep them out. Missouri.

Seasonal history of the corn ear worm. Iowa.

Cotton insects. (See also specific and Field crop insects.)

Cotton insects. Tex.

Insects attacking cotton, corn, and tobacco. Va.

Insect investigations.--To determine insect pests of cotton, sugar cane, corn, and truck crops, together with a miscellaneous collection of insects from the island. Virgin Islands.

The boll weevil. Ala.

Spraying for boll weevil. Ga.

The pink bollworm of cotton. Ala.

Cotton square stainer or tarnished plant bug control. Ariz.

Cowpea insects. (See also specific and Field crop insects.)

The cowpea aphid. Okla.

The cowpea weevil. Okla.

Cranberry insects. (See also specific and Fruit insects.)

Cranberry insects. Wash.

Insects injurious to cranberry bogs. Mass.

Cranberry insects (Cont.).

Cranberry insect enemies. N.J.

Crickets.

Life history studies of the common field cricket (Gryllus abbreviatus).
S. Dak.

Tree crickets of Oregon. Life histories, habits, and distribution
of species of the genus Cecanthus found within the State; methods
of control; bark diseases associated with tree crickets; parasites
and predaceous enemies. Oreg.

Cut worms.

The life history of several common cutworms. Nebr.

Cut worm and kafir ant investigations. Kans.

Fall army worm.

The grass worm or fall army worm. Ala.

False chinch bug.

The false chinch bug. Okla.

Field crop insects.

Insects injurious to roots of staple crops. Kans.

Investigation of southern field crop insects. S.C.

Flies. (See also Parasites- external.)

Investigations on root maggots. Mich.

Control of root maggots. N.H.

Biology of Pollenia rudis. Md.

Life habits of syrphus flies. Colo.

Bombyliidae. Utah.

Ecology and life history studies of Maine species of diptera with
special reference to economic species. Maine.

Control of the house fly and stable fly upon the University Farm.
Calif.

Forest insects.

Insects of forest, orchard, and shade trees, with the best method of combating them. Minn.

Host relationship and life histories of forest insects. Calif.

Forest insects and breeding cage work. Calif.

Studies on insects attacking the white pine. Conn. State.

Life history study of the locust borer. Ky.

The boxwood leaf miner. Md.

Fruit insects.

Insects of orchard, shade, and forest trees, with the best method of combating them. Minn.

Small fruit and truck crop insects. Minn.

Truck crop and small fruit insects. Minn.

Fruit insect investigations. Kans.

Studies on fruit insects in the Hudson River Valley: The apple red bugs, the pear thrips, the pear psylla and the plum curculio. N.Y. State.

Investigations on the fruit tree leaf roller. Mich.

The fruit bark beetle. Calif.

Garden insects. (See also Truck crop insects.)

Grape insects. (See also specific and Fruit insects.)

Control of the grape berry worm. Ohio.

Life history studies on various grape insects and experiments to determine methods of control. N.Y. State.

Grasshoppers.

Grasshoppers. Mont., Utah.

The egg laying habits of injurious grasshoppers. Iowa.

Grasshopper control. Colo.

Grasshopper control in the Plumas and Lassen National Forests. Calif.

Grasshoppers (Cont.).

A study of the grasshopper pest to determine the eating capacity of grasshoppers in alfalfa fields and observations on their feeding habits with reference to the use of poisoned baits. Ariz.

Greenhouse insects.

Greenhouse insect investigation. The rose typophorus and use of hydrocyanic gas as a fumigant. N.J.

The life history and control of the greenhouse mealy bug. Md.

The life history and control of the red spider. To study the life history under greenhouse conditions and to develop satisfactory methods of control. Md.

Hemiptera. (See also Aphids, Scale insects, Leaf hoppers, and specific crops.)

Hemiptera. Maine.

An ecological study of Jassidae and Cercopidae of Maine. Maine.

Studies on the life history of the green soldier bug. Ohio.

Studies of the stinking bug family. Ohio.

Psyllidae of New England, with reference to the economic status of this family of insects. Maine.

Biological and ecological studies of certain North Carolina hemiptera. N.C.

Hessian fly.

Hessian fly investigations. Ind., Kans.

The fall history of the Hessian fly-limits of the brood or broods if more than one. Ky.

The annual life cycle of the Hessian fly in Missouri and its control. Missouri.

A campaign against the Hessian fly, which was organized in 1915. Ohio.

Household insects. (See also Flies.)

Investigations of household insects, especially roaches. Mich.

The household cockroach. Minn.

The fish moth. Okla.

Hymenoptera.

Ecology and life history studies of Maine species of hymenoptera of economic importance. Maine.

Hymenoptera of Minnesota. Minn.

Insecticides and fumigants. (See also Horticulture Spraying, dusting, and fumigating.)

Insecticides. Minn.

Various tests of fungicides and insecticides. Conn. State.

The chemical, physical, and insecticidal properties of commercial pine oils and creosotes. Md.

Toxicity of insecticides. Calif.

Specific toxicity of various chemicals to insects and their hosts. Minn.

Tests of efficiency of newer insecticides. Ohio.

Insecticidal properties of lime hydrate, magnesium hydrate, slip and china clays. N.Y. State.

An investigation of insecticides with special reference to arsenate of lead. Ala.

Investigation of more recent insecticides and their value under Wisconsin conditions. Wis.

Control of insects by means of impregnation of the sap of plants with poisonous substances. W. Va.

Investigations of methods and effects of fumigation. Ala.

Study of the comparative toxic values of little-known insecticides and a comparative study of the powers of resistance of insects to poisons. Oreg.

Comparative insecticide tests, to study the lethal effect of new insecticides on plant tissues. Md.

Tests of various insecticides to find the value of materials sent in for trial. Why insecticides burn foliage. Mass.

Soil infesting insect investigations. Sodium cyanid and other soil fumigants for white grub and wire worms. N.J.

Insect control by egg treatment. Colo.

Progressive immunity of insects to insecticides. Wash.

Insecticides and fumigants (Cont.).

Analysis of insecticides and fungicides. Wash.

A study of the chemical and physical properties of liquid hydrocyanic acid. Calif.

Kafir insects. (See also specific and Field crop insects.)

Kafir ant and cut worm investigations. Kans.

Leaf hoppers.

Leaf hopper investigations. Wis.

Control of leaf hopper. Ark.

The apple leaf hopper in relation to tip burn of potatoes. N.Y. State.

Leaf miners.

Life history studies of three species of dipterous leaf miners. Md.

The boxwood leaf miner. Md.

Lepidoptera. (See also specific crops.)

Lepidoptera.--Ecological and life history studies of Maine species of economic importance with systematic work where necessary for definiteness. Maine.

Melon insects. (See also specific and Truck crop insects.)

Injurious insect pests of the melon and related crops. To determine what pests must be dealt with by growers of these crops and to develop a practical and effective means for preventing and controlling them. Missouri.

Midges.

Studies on the control of the chrysanthemum midge. Conn. State.

The study of the biology and control of the rose midge. Md.

Mites.

Eriophyes mites. Oreg.

The biology and economic relation to greenhouse crops of certain mites. Md.

The biology of the bulb mite. Conn. State.

Mites (Cont.).

Study of the cyclamen mite. Mass.

Mosquitoes.

Mosquito survey and life histories. Calif.

An investigation of the malarial mosquito plague in Missouri.
Missouri.

Mosquito investigation and control. N.J.

Natural control. (See also Phenological insect investigations.)

Determination of limits of pests in Massachusetts to determine what part of the State, if any, need not pay attention to these pests.
Mass.

Economic importance of digger wasps in relation to agriculture. Mass.

Introduction of Chinese mantid. Utah.

The investigation of parasitism as a factor in the control of injurious insects. N.Y; Cornell.

An investigation of the possibilities of artificial propagation and distribution of predaceous and parasitic insects of fruit tree leaf rollers and apple aphids. Oreg.

An investigation to determine the causes of the periodical recurrence of insect pests as scourges. To determine what forces are at work to cause the periodical recurrence of insect pests and to work out more effective methods of preventing them. Missouri.

Nursery insects.

An investigation to determine what insects are injurious to nursery stock in the State, their life histories, distribution, injury, and methods of control. Missouri.

To ascertain a method of control of the woolly aphis, especially applicable to trees in the nursery. Md.

Nursery and orchard inspection. Minn.

Onion insects. (See also specific and Truck crop insects.)

To study the control of the onion maggot. Mass.

An investigation of the life history, habits, and control of the onion maggot (Phorbia ceparum). Penn.

Spraying onions for the control of thrips. La.

Ornamentals, insects attacking. (See specific and Greenhouse insects.)

Parasites, external. (See also Flies, Mosquitoes, and Ticks.)

Insects and parasites affecting live stock, including the screw worm, wool maggot, and the goat louse. Tex.

Biting flies of cattle. Nev.

Life history studies of the stable fly (Stomoxys calcitrans). S. Dak.

Control of the house fly and stable fly upon the University Farm. Calif.

Repelling stable flies. Md.

Value of fly repellant (pine-tar creosote). Md.

Control of black flies. N.H.

Study of the hog louse. Tenn.

Peach insects. (See also specific and Fruit insects.)

The toxic reactions of the peach tree borer as affecting control. To ascertain the color reactions of adult peach tree borers. Md.

The peach borer. N.J.

Study of the peach borer. Tenn.

Control of peach and apple tree borers. W. Va.

The western peach and prune root borer. Oreg.

Studies on the life history of the lesser peach borer. Ohio.

Peach spraying for control of curculio and associated insects and diseases. N.C.

The oriental peach moth. N.J., Va.

Study of oriental peach moth (Laspeyresia molesta) in Maryland. Md.

Peanut insects. (See also specific and Field crop insects.)

Study of the life history, habits, and control of the principal insects of the peanut. Tex.

Pear insects. (See also specific and Fruit insects.)

Pear psylla. N.J.

Pear insects (Cont.).

Pear thrips. Oreg.

The leaf rollers and fruit worms of apple and pear. To ascertain improved methods for the control of the leaf rollers and fruit worms. Oreg.

The life history and methods of control of the pear sinuate borer. N.Y. State.

Pecan insects. (See also specific insects.)

Pecan insects. Ala., N.C.

A systematic and biological study of insects affecting the pecan. Miss.

Phenological insect investigations.

Climate and injurious insect investigations. Kans.

Investigation of effect of atmospheric moisture on insects. N.J.

Relation of temperature to insect life. W.Va.

The relation of temperature and moisture to insect activity. S.C.

Plum insects. (See also specific and Fruit insects.)

The plum curculio. N.J.

Control of plum curculio. Wis.

Life history studies of spring saw fly of plum (*Neurotoma inconspicua*). S.Dak.

Potato insects. (See also specific and Field crop insects.)

Potato beetle control. Mont.

Life history work with the potato beetle (*Leptinotarsa decemlineata*). Ia.

The life history and methods of control of the potato leaf hopper. Iowa.

The apple leaf hopper in relation to tip burn of potatoes. N.Y. State.

Potato leaf hopper. N.J.

The potato flea beetle. N.J.

Potato insects (Cont.).

Potato spraying and flea beetle control. N.C.

Plant lice. A comparison of nicotin sulphate and scalecide. A study of the green and pink potato and tomato aphids. Ohio.

Life history of the pink and green aphid of the potato. Va.

Prune insects. (See also specific and Fruit insects.)

The western peach and prune root borer. Oreg.

Pumpkin insects.

The pumpkin bug. Fla.

Red spider.

The red spider. Ala.

The life history and control of the red spider. To study the life history under greenhouse conditions and to develop satisfactory methods of control. Md.

San José scale.

San José scale: Life history and control. To study the life history and the control of this insect. N.Mex.

The seasonal development of the San José scale and relative susceptibilities of the different life stages to certain insecticides. N.Y. State.

Scale insects. (See also San José scale.)

The Lecania of Michigan. Mich.

Systematic and biological study of scale insects of Mississippi. Miss.

Scale insects of St. Croix and their control. To determine the number of species of scale insects and host plants of each. Spraying experiments to effect a control for the insects. Virgin Islands.

Life history studies of the gloomy scale. N.C.

The more resistant scales and leaf eating caterpillars. Ohio.

Shade tree insects.

Shade tree insects. Kans.

Shade tree insects (Cont.).

A survey of the shade trees in several cities for the purpose of insect control. Ohio.

Spinach insects. (See also specific and Truck crop insects.)

Relation of aphids to spinach blight. Va.

Squash insects. (See also specific and Truck crop insects.)

Observations to determine variation in amount of injury to squash, planted at different times during the year, by Melittia satyriniformis and Daiphania nitidalis. La.

Stored products insects.

A survey of the principal warehouses of the State to locate and assist in controlling injury to food products resulting from insect attack. Calif.

Insects infesting stored food products. Minn.

Control of insects on dried fruits. Calif.

Control of insect pests of growing crops, stored products, and live stock, with special reference to the increase and conservation of food products. Md.

Strawberry insects. (See also specific and Fruit insects.)

The strawberry weevil. Ark., N.J.

Dusting strawberry fields to control the strawberry weevil. Md.

Control of the strawberry aphid. Md.

Sugar beet insects. (See also specific and Field crop insects.)

The sugar beet louse. Mont.

Sweet corn insects. (See also specific and Truck crop insects.)

Experiments for the control of Chloridea obsoleta on sweet corn and tomatoes. La.

Sweet potato insects. (See also specific and Field crop insects.)

The sweet potato weevil. Ala.

The life history and control of the sweet potato weevil. Tex.

Sweet potato insects (Cont.).

Control of sweet potato scarabee. Experiments to try to lessen ravages of the scarabee among sweet potatoes grown on the island. Virgin Islands.

Termites.

Termite investigations. Kans.

The white ant. Okla.

Thrips.

A study of the life history of euthrips and Cryptothrips floridensis. Fla.

Ticks.

Tick investigations. Mont.

Investigation of cattle tick. To determine life history of cattle tick, including starvation period. P.R.

Tobacco insects. (See also specific and Field crop insects.)

Insects attacking tobacco, corn, and cotton. Va.

Insect enemies, variety, and fertilizer studies of tobacco. To study the insect pests and determine the best methods for their destruction. Guam.

A study of the life history and limits of broods of the tobacco worm (Phegethontius sexta). Ky.

Tomato insects. (See also specific and Truck crop insects.)

A comparison of nicotine sulphate and scalecide for the control of the green and pink potato and tomato aphid. Ohio.

Experiments for the control of Chloridea obsoleta on tomatoes and sweet corn. La.

Truck crop and garden insects.

An investigation of the life history habits and methods of control of the plant lice (aphididae) affecting truck crops. Penn.

Control of the corn ear worm on truck crops. W.Va.

To determine insect pests of truck crops, corn, cotton, and sugar cane, together with a miscellaneous collection of insects from the island. Virgin Islands.

Truck crop and garden insects (Cont.).

Important insects affecting garden crops, including Harlequin cabbage bug, cabbage aphid, cabbage butterflies, cabbage loopers, flea beetles, onion thrips, cut worms, squash bug, cucumber beetles, and possible new pests; to learn of the natural enemies and other factors influencing the prevalence of the pests; to determine possible adequate and practical means of control. N.Mex.

Observations with various truck crop insects. La.

Truck crop and small fruit insects. Minn.

Investigations of pea moth. Wis.

Velvet bean insects. (See also specific and Field crop insects.)

Life history studies of the velvet bean caterpillar. Fla.

Walnut insects.

The codling moth in walnuts. Calif.

Weevils. (See also insects of specific crops.)

Biological investigation of the genus *Bruchus* in North Carolina. N.C.

A Biological and economic study of the genus *Sphenophorus* in North Carolina. N.C.

Wheat insects. (See also specific and Field crop insects.)

Life history studies of the wheat stem maggot (*Meromyza americana*). S. Dak.

Wheat insect survey. Ohio.

An investigation of the "Hessian-fly-resistant" qualities of different varieties of wheat. Missouri.

Wheat straw worm. Utah.

White fly.

Parasites of the white fly, in relation to reasons for immunity or nonimmunity to the insect, physiological effect of the insect and its fungi on the citrus tree and effect of various insecticidal remedies on the tree. Fla.

A study of the life history and limits of broods of the white fly (*Asterochiton vaporariorum*) of greenhouses. Ky.

Wire worms.

The wire worm. Wash.

Miscellaneous.

Miscellaneous life history investigations. Ind.

Miscellaneous insects. Utah.

Insect life of North Carolina. N.C.

General insect investigations. Colo.

Insect control on test farms. N.C.

Entomological field work. Calif.

Insectary work. Minn.

Insect record. N.H.

The development of a collection of economic insects. Ariz.

The relations of insects to the transmission of fire blight. Ohio.

FOODS AND HUMAN NUTRITION.

Food preservation.

Canning investigations. Mass.

Microorganisms of the canning industry, to determine the organisms more frequently associated with the deterioration of canned products; the thermal death point of these organisms; the relationship existing between the hydrogen-ion concentration and the thermal death point in order to determine the most favorable composition of all materials for canning. Iowa.

Preservation of vegetables with salt. Calif.

Investigation concerning methods of preservation of Hawaiian grown food products. Development of practical home and factory methods of canning, preserving, drying, and pickling of various Hawaiian grown vegetables, foods and other food crops, especially bananas, avocados, taro, edible canna, sweet potatoes, papaya, and pineapples. Hawaii.

Experiments with canning peas and white beans. Idaho.

Bacteriology of canning. Kans.

A study of the thermal death point of Bacillus botulinus, especially in relation to the sterilization of canned vegetables. Calif.

Food preservation (Cont.).

The best stage of ripeness at which to harvest fruit for canning, drying and preparation of jams, jellies, and other fruit products. Calif.

Grape sirup as a substitute for sugar in canning. Calif.

Canning and preserving fruit without sugar. Calif.

Effect of weather conditions on processing and pasteurizing dates. Ariz.

A study of methods of making glace fruits. Calif.

Curing prunes. Calif.

Effects of cold storage on dried fruits. Calif.

Improvement of methods of pickling olives. Calif.

Fruit evaporation and by-products. Wash.

Methods of preparing fruit juices. Calif.

Studies in jelly making. Calif.

Effect of sulphuring on fruit tissues and its possible relation to the palatability of the dried product. Calif.

A survey of the deciduous fruit drying industry of the State. Calif.

An experimental study of equipment for drying and curing of deciduous fruits on a commercial scale. Calif.

Standardization of fruit handling methods for drying purposes. Calif.

Dehydration of fruits and vegetables. Colo.

Economical drying of wine and table grapes. Calif.

Selection and management of dry yards for curing fruit. Calif.

Effects of stacking in the process of drying fruit. Calif.

A study of the dipping of fruits preliminary to drying. Calif.

The functions of sulphurous acid in the drying of fruit and in the storage of dried fruit. Calif.

The sugaring of dried fruits. Calif.

Food preservation (Cont.)

New methods of packing dried fruits. Calif.

A study of the maximum water content of dried fruits. Calif.

A study of methods of fruit drying, designed to prevent darkening of fruit during process without use of sulphurous acid. Calif.

Drying vegetables. Calif.

Home drying of fruit. Calif.

Fruit drying, dipping fruit, the value of grading fruit before drying, the value of hot air circulation or humidity, etc. Oreg.

Curing meats on the farm. N.C.

Investigations to determine the relative values of different preservative agents for storage of eggs. Calif.

Microorganic changes in eggs with a special reference to cold storage. Oreg.

The keeping qualities of infertile eggs, when held by the producer. Tex.

Milling and baking.

Milling and baking tests with different varieties of wheat. Ohio.

Investigation on the milling quality of wheat. N.Dak.

The relation of the colloidal properties of gluten to problems of milling and baking. Nebr.

The strength of wheat flour- colloidal and other factors which may be involved in flour strength. Minn.

The biochemical changes in frosted wheat and their effects on the breadmaking quality and market value. Mont.

Cereal and flour investigations. Minn.

Baking qualities of flour. Wash.

Milling and baking technology. Ohio.

Milling investigations. Kans.

Miscellaneous.

Slaughter and curing of meats, to determine the most profitable way of disposing of hogs. Also the shrinkage in curing. Md.

Foods and Human Nutrition, miscellaneous (Cont.).

Meat work in connection with cattle, sheep, swine, and poultry studies. Slaughter test. Separation of edible and nonedible, determination of the fat, lean, and water content of the edible parts. Ohio.

Fermentations in production of sauerkraut. Commercial and home manufacture of sauerkraut. Microorganisms normal and essential in the production of sauerkraut. Iowa.

Studies on edible fungi, chiefly the morels and certain species of *Hypholoma*. N.Y. State.

Role of dairy products in practical nutrition. Okla.

Microbiological study of the deterioration of cane sugars. La.

Analysis of foods. Wash.

Human food. Tex.

Nutrition of infants. Utah.

The investigation of the food value for infants and invalids of various milks. Md.

Studies regarding the nutritive value of milk, its suitability for food for children and animals, conditions which affect its nutritive value, tolerance and related questions. Vt.

An examination of all preparations designed for food for diabetics. Conn. State.

A study of the effects of cereal diet on the capacity of the blood to combine with carbon dioxid. Ohio.

FEEDING STUFFS AND ANIMAL NUTRITION.

Animal nutrition.

Animal nutrition investigations. Kans.

Animal nutrition.--To measure in a general way the relative nutritive values of the great variety of materials used in feeding live stock. Mass.

Investigation of the nutritive value of feeds. Tex.

Chemical studies on animal nutrition and deficiency diseases. Minn.

Use of yeasts to further our knowledge of growth-promoting substances, or vitamins. Wis.

Composition, constitution, and properties of proteid bodies, especially those of ripe seeds and their relative efficiency in nutrition. Conn. State.

Animal nutrition (Cont.).

Comparison of nutrients from single plant sources and from different plants on development of animals. Wis.

Utilization and fate of the mustard oils in the metabolism of the animal. Wis.

The constitution, metabolism, and physiological effect of certain phosphorus bodies found in feeding stuffs. N.Y. State.

Deficiencies of feeds fed hens as affecting the vitality of chicks. Kans.

Factors that influence the composition of body fat. Kans.

Effect of different amounts of the same feeds on digestion and utilization in maintenance, growth, and fattening. Ill.

Study of factors influencing the normal rate of growth in domestic animals and the permanency of the effects of arrested development. Missouri.

The influence of submaintenance rations in the wintering and subsequent fattening for market, of farm animals. N.H.

Attempt to ascertain the use made of food by steers at different ages and in different conditions. Missouri.

Studies to ascertain the minimum quantity of butter fat necessary to produce normal development in a young growing animal. Oreg.

A chemical study of the nutrition of calves. Ind.

Metabolism trials with young calves. Iowa.

Influence of nutrition of heifers during their growing period upon their subsequent functional activities, size, vigor, and general usefulness. Missouri.

Protein requirements for growing cattle. Nebr.

Cooperative experiments on the protein requirements for growing cattle. N.Dak.

Protein requirements for the growth of cattle. Mass.

The protein requirements for growing calves. Va.

High and low protein requirements for growing animals. Md.

Metabolism of fresh milch cows. Calif.

Metabolism in dairy cows. Penn.

Effects upon milk production of varying amounts of the same feed. Penn. Inst. Anim. Nutr.

Animal nutrition (Cont.).

Minimum protein requirement of dry cows. Penn. Inst. Anim. Nutr.

The minimum protein requirement for milk production. Penn. Inst. Anim. Nutr.

Determination of the protein and energy requirements for milk production. Va.

Relative utilization of energy in milk production and in fattening. Penn. Inst. Anim. Nutr.

Factors influencing the composition of milk, the influence of the plane of nutrition of the cow. Missouri.

The effect of protein, calcium, and phosphorus fed pregnant swine and sheep upon the size, vigor, bone, coat, and condition of offspring. Iowa.

Mineral and organic acids for swine. Iowa.

The effect of age on rate, economy, and character of gains, involving individual feeding, slaughter tests, and a study of the carcass to determine the proportions of water, fat, and protein yield for hogs at 100, 200, 300, 400, and 500 lbs. weight. Ohio.

Metabolism and catabolism in the chicken. Ky.

Normal metabolism of a nonlaying hen. N.Y. State.

Normal metabolism of a laying hen. N.Y. State.

Metabolism of a hen under vitamin starvation. N.Y. State.

Metabolic experiments with young poultry.--Protein experiments. Calif.

Metabolic experiments with young poultry.--Corn protein experiment. Calif.

Metabolic experiments with young poultry.--Barley protein experiments. Calif.

Digestive experiments with poultry. N.C.

Importance of mineral constituents of feeding stuffs in the growth and development of farm animals. Wis.

Animal nutrition (Cont.).

The calcium balance of dairy cows. To study the causes of the negative calcium balance so frequently found in the case of dairy cows and if possible to evolve corrective measures. Iowa.

An attempt to reduce the negative calcium balance of milch cows by a daily alteration of two rations, the first high in calcium and low in fat and the second low in calcium and high in fat content. Iowa.

Calcium requirements of chickens. Wis.

Feeding stuffs, composition and nutritive value.

Nutrients in forage crops. Kans.

A comparison of corn alone with corn and oilmeals as feeds for young animals. Ohio.

Corn by-products feeding trial. Ind.

Chemical study of the grain sorghums. Okla.

To determine the value of the New Mexico pinto bean as a stock food. N.Mex.

The value of tornillo bean as a food; in what manner it should be fed for best results. N.Mex.

Investigation of the nutritive value of alfalfa in California. Calif.

Kudzu feeding experiments. La.

Feeding value of sunflowers according to maturity. Mont.

The nutritive value of the proteins of feeding stuffs. Ill.

Digestion experiments with sheep.--Materials studied include Diamond gluten meal, wheat gluten meal, corn bran, distillers grains, vinegar grains, garbage tankage, soy bean hay, sweet clover, Sudan grass, cabbages, carrots, mangels, turnips, pumpkins. Mass.

Digestion experiments with pigs. Ill.

A study of rations suitable for horses, including digestion of foods and energy values of foods and rations. Mass.

Mineral metabolism.

Retention of ash ingredients by cows in milk. Penn. Inst. of Anim. Nutr.

Methods of feeding mineral supplements to pigs. Ohio.

Mineral metabolism (Cont.).

The utilization of calcium compounds by swine. Ohio.

The comparative value of calcium carbonate, floats, precipitated bone flour and steamed bone flour as mineral supplements for swine. Ohio.

Experiments relating to the importance of certain mineral nutrients in the food for poultry. N.Y. State.

Mineral nutritional studies with poultry. N.C.

Silage and silage feeding experiments, general. (See also Field Crops--Corn, Animal Husbandry--Feeding experiments with different kinds of animals, and Dairy Farming.)

Silage investigations. Ark.; Kans.

Silage experiments. Oreg.

Silage studies. Va.

The silo in Guam. To determine the practical value of the silo under Guam conditions. Guam.

Chemical changes in silage. Mont.

"Sour milk" silage. Wash.

Studies in silage production.--Changes in chemical composition of alfalfa, oats, sorghum, kafir, and milo, during the siloing process. Losses of dry matter and its components in the siloing process in the case of the preceding crops. Calif.

A study of the chemical and physical variation of corn silage. Penn.

Silage feeding investigations. Kans.

Feeding experiments with silage. La.

Substitute feeding corn silage and cottonseed hulls. N.C.

A comparison of the relative food values per acre of silage made from large silage corn and common field corn. Ohio.

To determine the relative feeding value of corn silage when corn is cut at different stages of maturity. S.Dak.

A comparison of the nutritive values of silage made from early and late maturing varieties. Ohio.

Investigations in feeding value of stover silage and silage from thickly planted corn as compared to normal corn silage. Mich.

Silage and silage feeding experiments (Cont.).

A study of corn stover silage. Penn.

Comparison of corn stover silage and ordinary corn silage for milk production. Penn.

Use of silage other than corn in the feeding of beef cattle and sheep. Idaho.

The composition and properties of silage prepared from the grain sorghum. Okla.

The value of Sudan grass silage for dairy cows. Calif.

Pasturage and ensilage production for sheep. Nev.

Silage investigations including the acidity of silage made from sunflowers, beet tops and artichoke tops; digestion coefficients of sunflower and beet top silage. Idaho.

A comparison of corn silage, artichoke silage, sunflower silage, carrots, and potatoes as feed for milk production. Wash.

Sunflower silage v. cane silage.--To ascertain the value of sunflower silage as compared with corn silage as a feed for beef cows and young beef stock. N.Mex.

The production of sunflower silage. Nev.

Value of sunflower silage for dairy cows. Mich.

Comparison of sunflower silage with clover hay for dairy cows. Mont.

Sunflower silage for baby beef. Mont.

A comparison of corn silage with oat and pea silage for milk production. Penn.

Comparison of corn silage and corn-soy-bean silage for milk production. Penn.

Chemical study of silage made from alfalfa mixed with other green crops. Nebr.

Clover silage for beef production. Mont.

ANIMAL HUSBANDRY.--CATTLE.
(See also Dairy Farming.)

General.

Live stock survey. W.Va.

Cattle, general (Cont.).

Beef cattle field work. N.C.

Placing of pure bred bulls over the State. Md.

The introduction of pure bred beef cattle. Ky.

Herd records. N.C.

Herd maintenance. N.Dak.

Identifying calves. N.C.

Beef production. N.Dak.

Wintering stock cattle in barns. N.C.

Outdoor feeding of beef cattle. N.C.

Winter grazing beef cattle. N.C.

Breeding.

Breeding experiments. N.Dak.

Experimental analysis of the heredity factors determining milk and meat production in cattle. Wis.

Breeding experiments with beef cattle. S.C.

Physiology of reproduction in cattle, including experiments on feeding organ extracts, the study of freemartin heifers, etc. Maine.

Spermatozoa studies. Oreg.

Multiple births in cattle. Wis.

Investigation of the effects of inbreeding. Ill.

Age as a factor in animal breeding. Missouri.

Sex type as related to functional development and performance in Shorthorn cattle. Kans.

Effect of cottonseed meal and other nitrogenous feeds on the breeding quality of animals. Okla.

A study of the progeny of the bulls used on the experiment station herd. S.C.

Cooperative breeding records.--Records are secured from the leading cattle breeders. Maine.

Cattle, breeding (Cont.).

Building up a grade herd from native stock and pure bred Angus, Hereford, and Shorthorn bulls. Miss.

Breeding dual purpose cattle.--To test adaptability of milking Shorthorns to that section of the country. Alaska.

Influence of feed, environment, and breeding on native unimproved cows, and their offspring, as regards development of milk-producing qualities, composition of milk, digestive capacity and utilization of feed in dairy and beef production. Iowa.

The improvement of range cattle by the use of superior sires. Tex.

Cattle breeding for beef, to ascertain if good cattle could be reared on native pasture. Alaska.

Cattle breeding to encourage the breeding of improved cattle, and to determine the degree of hardiness possessed by progeny of pure bred Ayrshire cattle under Guam conditions, and to evolve a strain of cattle for Guam, resulting from different crosses of Ayrshire, on native cows for the purpose of attaining maximum hardiness, size, feeding qualities, etc. Guam.

Cattle breeding.--To improve the breed of cattle found in Porto Rico. P.R.

Yak breeding (subject to procuring breeding stock).--To produce a race of cattle that shall be as hardy as the moose. Alaska.

Cost studies.--Production, finishing, and maintenance. (See also Rural Economics.--Cost of production.)

Studies on the economy of calf raising. Ill.

Cost and methods of fitting pure bred cattle for sale.--To determine the amounts of feed consumed and best methods of fitting registered cattle for sale. Oreg.

An experiment to determine the cost of fitting beef cattle for the show ring. Calif.

Rations for and cost of production of grade beef cattle. Ark.

Feeding experiments, general. (See also Feeding stuffs and Animal nutrition--Silage and silage feeding experiments.)

Feeding experiments. N.C.

Maintenance of breeding cows. Ill.

Maintenance of beef breeding cows. Penn.

Cattle, feeding experiments, general (Cont.).

Maintenance rations for breeding cows. Growing rations for young cattle. Wyo.

Feeding cottonseed meal to calves. N.C.

Finishing calves. Ill.

Growing beef cattle. W.Va.

Comparative rations for growing and wintering beef heifers. Okla.

Baby beef growing and fattening. Free choice calf feeding. To study the production costs on the growing and fattening calves intended for baby beef production and the reliability of the appetite of calves as manifested in their choice of feeds suitable for their development and profitable growth. Iowa.

Cattle feeding tests, to determine the value for cattle feeding of certain locally adapted feeds and pasture crops. Guam.

Short feeding of steers.--To determine the possibility of finishing steers in less than the usual time by the use of the lighter grains with chopped hay and silage. Oreg.

Cooperative steer feeding work, at Allenville, Marengo Co., Ala. Ala.

Steer feeding experiments. Colo.

Steer feeding investigations. Idaho.

Winter steer feeding.--A study of the economic value of different amounts of corn in the ration, a comparison of corn, and corn and soy bean silage as roughage for fattening cattle with and without supplements, and the value of cottonseed meal with corn silage for fattening cattle. Ind.

Fattening steers. Ind.

Steer feeding. N.Dak.

Steer feeding investigations. Ky.

Beef cattle feeding over the State. Md.

Rations for fattening steers. Penn.

Steer feeding: To find the combination of feeds best suited to the fattening of steers under western conditions where alfalfa is plentiful and corn is high in price. Utah.

Cattle feeding. Tex.

Cattle, feeding experiments, general (Cont.).

Feeding beef cattle. W.Va.

Preparation of corn in fattening steers. Penn.

Feeding cottonseed meal, cottonseed hulls, and corn to beef cattle. N.C.

Fattening cattle in winter.--Relative value of protein supplements. To determine the relative value of protein supplements where added to a basal ration of corn, corn silage, and alfalfa hay. The quantity of protein supplement to add to this basal ration. Iowa.

Feeding cottonseed meal, ear corn, cottonseed hulls, and corn silage to beef cattle. N.C.

Feeding experiments on the production of beef to test the value of peanut meal as a protein feed as compared with velvet bean meal. Fla.

Substitute feeding corn silage and cottonseed hulls. N.C.

Cattle feeding: To determine minimum amount of silage required to keep thin cows alive. Ariz.

Comparison of hay (chiefly timothy) and corn silage for use in the winter rations for breeding cows. Ohio.

To determine the value of tornillo bean as a food, in what manner it should be fed for best results. N.Mex.

Grazing and range experiments.

Grazing investigations. Kans.

To determine the carrying capacity of West Texas ranges. Tex.

Grazing trials. N.Dak.

Maintenance of range cows on dry farm crops, during periods of range shortage.--To show that it is profitable to keep range cows in condition to produce strong healthy calves and supply them with sufficient nourishment to make vigorous, rapid growth. To compare kafir silage with Sudan hay, both feeds being supplemented with cowpea hay. N.Mex.

Chamiso, or shadscale (Atriplex canescens) for cattle maintenance. N.Mex.

To determine the value of ground Yucca as a maintenance ration for cattle on the drought-stricken ranges of the western part of the State. Tex.

Cattle, grazing and range experiments (Cont.).

The soap weed (Yucca elata) and its feeding and nutritive value for range cows. N.Mex.

To determine whether any advantage is to be gained by dehorning cattle on the West Texas ranges. Tex.

Limited rations for beef cattle.

To determine the relative economy of a limited compared with a heavy y. full grain ration in conjunction with alfalfa pasture. Calif.

Light y. heavy rations. Ill.

A comparison of light, medium, and heavy grain rations for fattening young cattle. Ohio.

Heavy and light grain rations when fed in connection with corn silage and clover hay for fattening steers. Missouri.

Corn belt ration for fattening steers y. no corn except that in silage. Wis.

ANIMAL HUSBANDRY. --- SHEEP AND GOATS.

General.

Work with sheep at Highmoor. Maine.

Sheep production and feeding. N.Dak.

The adaptability of range sheep in the Santa Cruz Mountains. Calif.

Breeds and breeding.

Sheep breeding experiments. Ky., Va.

Sheep breeding. Production of a hardy breed suited to the coast region. Alaska.

A study of the leading breeds of sheep with special reference to production factors. Idaho.

Sheep breeding experiments to build up a flock of high class grades from native ewes, using pure bred Shropshire, Southdown, and Dorset rams. Miss.

Sheep breeding. N.H.

Sheep breeding and feeding. N.C.

Sheep and Goats, breeds and breeding (Cont.).

Comparison of rate, economy, and character of gains produced by Delaine and by crossbred lambs. Ohio.

A study of the inheritance of wool production. Ohio.

Establishing a breed of sheep for winter lambing and a study of inheritance of characters. Okla.

Crossbreeding experiment with sheep. Penn.

A study of crossbreeding western range ewes with a pure bred mutton ram. Penn.

A breeding experiment with sheep to develop a breed hardier and better suited to conditions than those we now have, to eliminate the tail of the sheep by breeding, and retain other desirable features. S.Dak.

Sheep breeding and feeding investigations. To determine whether any particular crossbred lamb, handled under similar conditions with the straight Rambouillet lamb, will possess any special advantage as a lamb for the ranchman and farmer. Tex.

Sheep (Caracul) breeding investigations. Tex.

Ewes.--Feeding.

Fattening and marketing old ewes. Calif.

Wintering pregnant ewes. Iowa.

Feeding experiments with sheep to compare shredded corn stover, pasture grass hay, and cowpea hay as roughage for wintering breeding ewes, using cottonseed meal. Miss.

Winter breeding ewes.--A comparison of oats and clover hay, and oats, clover hay, and beets, and to determine the cost of winter feeding under farm conditions. Mont.

Feeding old ewes for lamb and mutton production. To determine if it is profitable to breed broken mouthed ewes for winter lamb production and feed the ewes on waste roughage of irrigated farms, during the fall and winter, with a small grain ration during the winter, and then sell both lambs and ewes in the spring for lamb and mutton. N.Mex.

A comparison of different roughages in winter rations for breeding ewes. Ohio.

A comparison of large, medium, and small amounts of protein in the ration for breeding ewes, with respect to rate and economy of gain by ewes and lambs, and amount of grease and scoured wool produced. Ohio.

Ewes, feeding (Cont.).

Comparative rations for wintering breeding ewes. The comparative value of kafir silage, kafir fodder, Sudan hay, wheat straw, kafir heads, kafir grain when combined with the protein supplements, cottonseed meal, and alfalfa hay for breeding ewes. Okla.

Maintenance ration for breeding flocks of mutton and wool sheep. Penn.

The value of pea straw as a roughage for wintering pregnant ewes. Wash.

Pea straw as a roughage for ewes suckling lambs. Wash.

Maintenance ration for breeding ewes, growing rations for ewe lambs. Wyo.

Feeding experiments, general. (See also Animal nutrition.)

Sudan grass as a forage crop for sheep. Calif.

Grain stubble for sheep. Various rations for fattening sheep. Calif.

Rations for fattening sheep. Nebr.

Feeding and finishing range ewes and lambs.--Feeding old ewes, feeding lambs before shipment in the autumn. Nev.

Pasturage and silage production for sheep.--Studies of desirable mixtures of grasses and clovers for pasturage; the production of sunflower silage. Nev.

Feeding cottonseed meal to sheep. N.C.

Sheep fattening. N.Dak.

Various amounts of grain in connection with green forage crops for ewes and lambs, including a comparison of dry lot feeding and feeding on forage. Ohio.

The effects of grazing sheep on sorghum crops. Tex.

Feeding breeding sheep. W.Va.

Lambs.

The effect of calcium, protein, and phosphorus fed pregnant sheep, and swine upon the size, vigor, bone, coat, and condition of offspring. Iowa.

The effect of iodine fed pregnant ewes upon size, vigor, bone, and condition of offspring. Iowa.

Lambs (Cont.).

Economical rations for finishing lambs. Idaho.

Lamb feeding.--A comparison of various rations for fattening lambs. Ind.

Fattening western lambs. Ind., Kans.

Gluten feed v. wheat bran for wintering ewe lambs. Wis.

Linseed meal v. cottonseed meal v. gluten feed for fattening lambs. Wis.

Ground faterita, milo, kafir, and corn for fattening lambs. Tex.

Tornillo bean lamb feeding experiments. In order to obtain information as to their use for fattening or as a substitute for grain or a portion of it. N.Mex.

A comparison of silage from ordinary field corn with silage from large-growing silage corn for use in the rations of fattening lambs. Ohio.

The value of pea straw as a roughage for lambs. Wash.

Growing lambs for market. Ill.

A study of the birth weights and rate and cost of gain from birth to weaning of lambs from ewes of different ages and breeds. Calif.

A study of the rate, economy, and character of gains produced by lambs marketed at different ages. Ohio.

Cost of producing lambs on the farm. Calif.

Cost and method of raising spring lambs. To determine the cost in feed and pasture of raising spring lambs and the relative values of the different types of management. Oreg.

Lambing range ewes in dry lot. Ariz.

Increasing the lamb crop on the range. Calif.

Fattening range lambs in dry lots. Iowa.

Lamb production: Methods of producing more and better lambs in Nevada range flocks. Lambing under shelter, use of better bucks, saving bumper lambs, feeding concentrates to ewe bands in winter on the open range, feeding ewes which lamb under shelter to secure a richer and more abundant milk supply. Nev.

Lamb docking studies: Knife v. the hot iron. Tex.

Lambs (Cont.).

June shearing of lambs. To determine whether the practice of shearing early lambs of the long woolled breed in June is beneficial.
Oreg.

Wool.

Wool investigations. Wyo.

Effect of various factors upon the wool and form of the sheep.
Mont.

Wool investigations; growth and shrinkage of six and twelve months wool. Calif.

To determine the relation of feed to the growth and composition of wool. S.Dak.

The effect of rations containing a high percentage of sulphur upon wool fiber. Wyo.

Alkali and weathering studies with wool. Wyo.

The effect of some of the most common sheep dips upon wool. Wyo.

Goats.

Improving grade Angora goats through selection, making use of registered Angora bucks of superior breeding. Tex.

Development of an improved type or strain of Angora goats which will reproduce true to type. Tex.

Comparison of Angora goats producing heavy, oily fleeces, with those producing finer quality, lighter hair. Tex.

Goat breeding. To encourage the breeding of improved milch goats. To ascertain the degree of hardiness possessed by the different crosses. Guam.

Breeding Toggenburg goats. To see if goats will thrive and adapt themselves to Alaska conditions. Alaska.

Milch goat improvement. To determine the milk-producing capacity of the native goat and the improvement that may be expected by the use of pure bred bucks from a milk breed such as the Toggenburg. Records of the cost of producing milk will also be kept. N.Mex.

Goat feeding tests. To determine the most desirable feeds and feeding methods in connection with the production of pure bred and grade milch goats. Guam.

Dipping Angora goats to exterminate the goat louse (Trichodectes climax). Tex.

ANIMAL HUSBANDRY.--SWINE.

General.

Work with swine at Highmoor. Maine.

Cooperative experimental work with hogs at Union Springs, Bullock Co., Ala. Ala.

Economic swine production. Tex.

Pork production. Nebr.

Pork production as a feature of diversified farming. Idaho.

Methods of growing pigs. Penn.

Raising pigs without grain. W.Va.

Swine feeding experiments. To determine the condition and profits in producing pork by the suburban residents in the backyard. Md.

Hog raising.--To show how best to handle hogs. To breed pure bred stock for sale as farm demonstration work. Alaska.

Growing runts. To determine whether runts, if separated from the larger and more vigorous pigs would make satisfactory gains. Oreg.

To test devices for identification of market hogs. Calif.

Breeds and types; Breeding.

Swine breeding. Minn.

Swine breeding.--To encourage the breeding of an improved type of hog; and to determine the degree of hardiness possessed by the progeny of pure bred Berkshire hogs under Guam conditions and to evolve a strain of hogs for Guam resulting from different crosses of Berkshires on native hogs for the purpose of attaining maximum hardiness, size, feeding qualities, etc. Guam.

Swine breeding experiments. To note the inadvisability of raising breeding stock from gilts. Md.

Experiments with bacon type and lard type hogs. Ohio.

Type test with swine. Iowa.

The breeding of young sows. W.Va.

Effect of cottonseed meal and other nitrogenous feeds on the breeding quality of animals. Okla.

Brood sows, maintenance and management.

Maintenance of brood sows. Mont.

Maintaining brood sows. Penn.

Maintenance of brood sows.--To determine the economy of forages and leguminous hays in ration for breeding swine and to compare the efficiency when fed to brood sows, also of different leguminous hays. Missouri.

Comparison of rations, methods of shelter, and methods of management for wintering brood sows. Wis.

To determine the effect of exercise or lack of exercise for brood sows upon the litters. Oreg.

An experiment in breeding and feeding to determine the effect of feed and exercise of the sow, during the period of gestation, on her offspring. S. Dak.

Wintering pregnant sows. Iowa.

Cost of wintering brood sows. Del.

Legume hays v. tankage as proteid supplements for wintering brood sows. Relative value of various legume hays in cheapening the winter ration. Influence of the use of these on the size and vigor of pigs produced. Ark.

A comparison of rations for brood sows and for suckling pigs. Ohio.

The value of tankage as a winter feed for brood sows and young pigs. Utah.

The effect of feeding velvet bean meal to brood sows. Fla.

Cost of production. (See Rural Economics--Cost of production.)

Feeding experiments, general. (See also Animal nutrition.)

Swine feeding and nutrition. Minn.

Hog feeding experiment at University Farm. Ariz.

Finishing work. N.C.

Economical rations for finishing swine. Idaho.

Suitable rations for fattening hogs. Ind.

To determine the value of some uncommon by-products feeds as a feed for swine. Md.

Swine, feeding experiments, general (Cont.).

The value of succulent and dry roughages in fattening rations for pigs. Wyo.

Swine feeding tests. To determine the feeding value for swine of certain feeds and pasture crops that may be produced locally. Guam.

Dry lot rations for swine. Iowa.

To determine the most profitable way of utilizing the corn crop as a feed for swine. Md.

Continuous feeding of grain to pigs with pasture when available, compared with alfalfa pasture alone when available, and stubble pasture in season. Calif.

Cane molasses for hogs. To determine the extent to which the palatability of a ration is increased by the use of molasses in connection with shorts or barley. Oreg.

Root molasses as feed for young hogs. The value of tankage as a winter feed for brood sows and young pigs. Utah.

Feeding cottonseed meal to hogs. N.C.

The value of alfalfa as a supplement to a diet of corn and tankage and kafir and tankage, respectively, when fed continuously to three generations of swine. Kans.

Forage crops for hogs; Hogging-off.

Forage crops for growing and fattening swine. Ark.

Experiments with forage crops for swine. Idaho.

The value of forage crops for hogs. Ill.

Forage crops for swine. Iowa.

Hog grazing crops. La.

Hog grazing experiments. La.

Experiments to determine the relative value of forage crops in pork production. S.C.

Swine grazing experiments. Tex.

Hog pasture experiments. Va.

Comparison of forage crops for swine and of concentrates and supplements to feed on forage. Wis.

Forage crops for hogs (Cont.).

Forage crops for pork production. Wash.

Forage crops for hogs. W.Va.

Limited y. full feeding on different forage crops. Ind.

Hogging-down corn. Ill.

Hogging-off corn. N.Dak.

Grazing and hogging-off peas and corn. N.Dak.

Experiments with field peas in pork production.--Hogging-off field peas. Idaho.

To determine the value of different forage crops sown in corn fields after the last cultivation as compared to the different by products fed to swine while hogging-off corn. S.Dak.

Soy beans and corn as compared with corn alone for hogging-down. Iowa.

A comparison of different varieties and different methods of planting soy beans in corn for silage and for hogging-down. Iowa.

Experiments in the hogging-down of soy beans, cowpeas, and corn, and comparing velvet bean meal, tankage, and soy bean meal as supplements to corn meal in feeding hogs. Ky.

Hog forage test in the use of rye, rape, and soy beans. Ohio.

To determine the relative amount of pork per acre of a crop of peanuts, as compared with a crop of soy beans and corn planted in alternate rows, and to determine the influence of the soy beans on the quality of the carcass of the hogs grazing the combined crop of corn and soy beans. Ala.

Feeding peanuts, soy beans, and other southern grazing crops to hogs. N.C.

Soy bean forage for fattening growing pigs. Del.

Garbage for hogs.

A survey of utilization of garbage for feeding swine in California. Calif.

Tests of feeding value of garbage for hogs. Mich.

Study of garbage feeding for swine. N.J.

Garbage for hogs (Cont.).

Comparison of feeds for fattening hogs by using garbage, corn, kafir, barley, and oats for fattening. Okla.

The value of garbage for hogs. To determine the value of garbage as a ration for fattening hogs. Oreg.

To determine if cooked citrus fruit rinds have any poisonous or toxic effects on hogs. Md.

Grain rations for hogs.

Limited grain rations for hogs. W. Va.

Barley chops for fattening swine. Tex.

Fine, coarse, and rolled barley for hogs. To determine whether there is a noticeable difference in the feeding values of fine, coarse, and rolled barley. Oreg.

Comparison of methods of preparation of barley for hog feed. Okla.

Supplements to barley in swine rations. Mont.

Comparison of protein supplements to barley and corn for swine: Skim milk, whey, tankage, linseed meal, and wheat middlings, when fed separately and in combination. Wis.

Barley v. corn for swine and comparison of methods of preparing barley. Wis.

Barley v. corn for fattening swine. Missouri.

Barley and wheat for pigs when supplemented with tankage. Mont.

A comparison of the preparation of corn: A study of various protein supplements in fattening swine. Penn.

Study of corn by-products for fattening hogs. Ind.

Hominy feed v. corn for fattening swine on forage. Missouri.

Oats for hog feeding. To determine the value of oats as a hog feed, both for growing pigs and for fattening hogs. Oreg.

Comparative tests of rye, barley, and corn for hogs. Mich.

Rye for feeding growing pigs. Del.

Comparison of feeds for fattening hogs by using corn, kafir, barley, oats, and garbage for fattening. Okla.

Grain rations for hogs (Cont.).

Comparing darso, kafir, and corn in fattening hogs by use of the self-feeder. Okla.

To determine the relative values of milo in different forms and milo v. barley for fattening hogs. Calif.

To determine the relative value of milo in different forms for pork production. Calif.

Protein supplements for kafir for hogs. Okla.

"Tin plate" middlings compared with ordinary middlings for fattening swine. Ohio.

Mineral supplements for hogs.

The effect of calcium, protein, and phosphorus fed pregnant swine and sheep upon the size, vigor, bone, coat, and condition of offspring. Iowa.

Influence of sulphur on development of swine, with special reference to hair growth. Iowa.

Mineral and organic acids for swine. Iowa.

Effect of ash and protein added to rations for fattening hogs under practical conditions. Kans.

Methods of feeding mineral supplements to pigs. Ohio.

The utilization of calcium compounds by swine. Ohio.

The comparative value of calcium carbonate, floats, precipitated bone flour, and steamed bone flour as mineral supplements of swine. Ohio.

Protein supplements, general.

Protein supplements for fattening swine. To determine the relative value of various protein supplements. Ark.

Comparative values of various protein supplements in pork production. Calif.

Efficiency of protein concentrates from different sources for fattening pigs. Del.

Effect of ash and protein added to rations for fattening hogs under practical conditions. Kans.

Supplemental feeds for swine. Mont.

Swine, Protein supplements, general (Cont.).

Supplements to barley in swine rations. Mont.

Swine.--A study of different kinds and proportions of feeds suitable for use as supplements to corn. Soy bean oil meal has been studied. Ohio.

Protein supplements for kafir for hogs. Okla.

A comparison of the preparation of corn: A study of various protein supplements in fattening swine. Penn.

A comparison of various protein supplements for fattening pigs on concentrates and forage crops. Penn.

Comparative value of different concentrates in pork production. S.C.

Protein supplements, specific. (For peanuts see Soft pork.)

Coconut meal as a protein supplement. To determine the value of coconut meal as a protein supplement in fattening hogs and particularly to test its palatability. Oreg..

A comparison of fishmeal and 40 per cent tankage as the protein supplement to corn in a fattening ration for hogs. Ala.

To determine the possibility of using fishmeal as a source of protein in feeding swine. Md.

Fishmeal v. tankage as a supplement to corn in rations for fattening swine. Missouri.

A study of the comparative values of fishmeal, semi-solid buttermilk, and tankage as feeds for swine. Tenn.

Skim milk v. whey in pork production. Calif.

Comparison of protein supplements to barley and corn for swine: Skim milk, whey, tankage, linseed meal, and wheat middlings when fed separately and in combination. Wis.

Semi-solid buttermilk v. tankage as a protein supplement in rations for fattening swine. Missouri.

A study of the comparative values of semi-solid buttermilk, fishmeal, and tankage as feeds for swine. Tenn.

The value of tankage as a winter feed for brood sows and young pigs. Utah.

Wheat and barley for pigs when supplemented with tankage. Mont.

Swine, protein supplements, specific (Cont.).

Tornillo bean pig feeding experiment. To determine its value as a food and learn in what manner it should be fed for best results. N.Mex.

Experiments in the hogging-down of soy beans, cowpeas, and corn, and comparing velvet bean meal, tankage, and soy bean meal as supplements to corn meal in feeding hogs. Ky.

The value of alfalfa as a supplement to a diet of corn and tankage and kafir and tankage, respectively, when fed continuously to three generations of swine. Kans.

Legume hays v. tankage as proteid supplements for wintering brood sows. Relative value of various legume hays in cheapening the winter ration. Influence of the use of these on the size and vigor of pigs produced. Ark.

Self-feeders.

Self-feeders for fattening swine. To determine their economy and advisability. Ark.

To obtain data on self-feeding and hand-feeding of swine. Ill.

Study of use of self-feeders for hogs. N.J.

A comparison of hand-feeding and self-feeding for swine. Ohio.

A comparison of the self-feeder v. hand-feeding for young pigs on forage. Penn.

Soft pork.--In connection with feeding peanuts, etc.

Effect of some southern feeds on the properties of lard. Ala.

The use of peanut meal for fattening hogs. Fla.

Experiments to determine how much peanut meal could be fed to hogs and still produce a hard pork. Fla.

The relation of peanuts and peanut meal when fed to hogs to softness and other changes in the pork. Ga.

Feeding peanuts, soy beans, and other southern grazing crops to hogs. N.C.

Effect of various feeds upon the quality of the meat product. Okla.

A study of the causes of soft pork. Tex.

Influence of water consumption on the quality of pork. Tex.

Soft pork.--In connection with feeding peanuts, etc. (Cont.).

Influence of feed and exposure on the quality of pork. Tex.

Study of the effects of rice bran when fed in various combinations with corn chops and tankage, on the quality of pork. Tex.

ANIMAL HUSBANDRY.--HORSES AND MULES.

Breeding.

Horse breeding.--To encourage the breeding of improved horses, and to determine the degree of hardiness possessed by progeny of pure bred Morgan horses under Guam conditions, and to evolve a strain of horses for Guam resulting from different crosses of Morgans on native mares for the purpose of attaining maximum hardiness, size, feeding qualities, etc. Guam.

Horse and mule production in West Virginia. W.Va.

Breeding experiments with horses and mules. S.C.

Mule breeding. Miss.

Feeding.

Feeding pure bred draft mares from weanlings to two-year olds. Ill.

A comparison of corn and oats for growing fillies and for these animals when used for farm work. Ohio.

Cost of raising colts from brood mares used for farm work. Ohio.

Developing draft colts. Ark.

Horse feeding tests. To determine the value for horse feeding of certain foods and pasture crops which may be produced locally. Guam.

A study of rations suitable for horses, including digestion of foods and energy values of foods and rations. Mass.

Barley v. oats for work horses. Wis.

Timothy v. marsh hay for work horses. Wis.

Oat straw as winter roughages for farm work horses, fed in conjunction with a grain ration of 2 parts corn, 2 parts oats, 1 part bran, and linseed meal to balance the ration. Missouri.

ANIMAL HUSBANDRY.--POULTRY.

Breeding.

Poultry breeding. Utah.

Poultry breeding experiment. To increase egg yield, uniformity of eggs, prepotency of egg production, and breed characteristics. To compare size, vitality, development, and vigor of chicks hatched from eggs of the same hen in the first, second, and third laying years. N. Mex.

Improvement and conservation of farm poultry. Kans.

Developing a high-producing flock from common hens. Ark.

Chicken breeding. To encourage the breeding of improved breeds and varieties of chickens; the determination of the adaptability of various breeds and the development of certain desirable crosses. Guam.

Breeding single comb white leghorns and barred Plymouth Rocks for egg production. Ind.

The breeding of pure bred poultry for high egg production. Ky.

Breeding for egg production. Mont.

Breeding for egg production (using Rhode Island Reds). Iowa.

A study of the influence of selection on egg production. Ala.

Selective breeding experiments with poultry, involving the testing of individual birds and the rearing of young from numerous matings. N.Y. State.

Selection for vigor. W. Va.

A determination of the mode of inheritance of various characters of poultry and a study of other factors governing form and function. Breeding for increased egg production. The relation between the primary sexual organs (testes and ovary) and the remainder of the organism. Study of the hatching quality of eggs from the statistical and genetic standpoint. Mass.

Influence of range of egg laying on fertility, hatchability, and egg laying of offspring. Okla.

Poultry breeding.--Continued close breeding of fowls. Conn. Storrs.

The effect on vigor of close inbreeding. Conn. Storrs.

Effect of close inbreeding on egg production and on fertility and hatchability of eggs. Oreg.

Poultry, breeding (Cont.).

Inbreeding in poultry. To test the effect of inbreeding on the quality of the stock. Maine.

Studies on inbreeding with Rhode Island Red fowls. Wis.

Breeding experiments with poultry, including inheritance of heavy egg production; the age of the fowl as a limiting factor; early maturity in the pullet as a measure of egg-laying capacity; relative influence of sire and dam in the production of the female offspring; effect of close inbreeding on production and on vigor of the offspring; visible characteristics as shape, date of moulting, loss of yellow color in shanks, beak and ear lobes, inheritance of heavy laying as related to longevity. Oreg.

Inheritance of high egg production. Oreg.

Study of inheritance of ability for egg production, together with the development of high fecundity lines through line breeding. N.J.

Hybridizing poultry. Reciprocally crossing Barred Plymouth Rocks with other breeds. Experiments bearing on the inheritance of linked characters. Maine.

Influence of sire and dam in the transmission of egg laying qualities. Oreg.

Influence of the male bird on egg production. Conn. Storrs.

Study of the inheritance of egg shell color. N.J.

Chicks, brooding and feeding.

Deficiencies of feeds fed hens as affecting the vitality of chicks. Kans.

Further studies of chick mortality. N.C.

Problems of incubation and brooding. Mich.

Brooding tests. To determine the effectiveness and economical difference in operating the different types of brooders which are practical for farm use. N.Mex.

Poultry management. Tests of the more successful of the coal stove brooders with the view of determining the most efficient. To secure data on the most successful management to be followed for the long continuation of a poultry plant. Maine.

Chicks, brooding and feeding (Cont.).

Comparison of rations for chicks, including a study of natural and artificial brooding; a comparison of simple and variety rations; a study of sour milk as a supplement to rations made up only of grains and others that contain a number of home grown and commercial feeds. Ohio.

Nutrition problems of chicks in confinement. Ind.

The essentials in a ration for baby chicks. Nebr.

Feeding chicks. Ind.

Study of growth in chicks with reference to the relation between hatching time and the profit to be derived from the sale of broilers and roasters. Mass.

Cost of production. (See Rural economics.--Cost of production.)

Egg-laying contests and routine records.

Egg-laying contest. N.Dak.

National egg laying contest. Tex.

Trap nest records. Ohio.

Routine work with poultry. Exact and detailed records of all matters concerning poultry, including autopsies of all birds dying, etc. Maine.

Egg-laying, physiology and correlations.

Physiology of reproduction in poultry. The mechanism of the internal secretions and their relation to egg production and to secondary sexual characters. Maine.

The relation between the primary sexual organs (testes and ovary) and the remainder of the organism. Mass.

An investigation to determine the effect of time of hatching on the moulting of fowls, the monthly egg production, and age of beginning to lay, during pullet year. Calif.

Broodiness in poultry. Mass.

First year's production as correlated to subsequent years. Oreg.

Correlation between early laying maturity and annual production. Oreg.

Egg-laying, physiology and correlations (Cont.).

Comparison of egg production as regards feed requirement, numbers and distribution, by pullets hatched in February, April, and June, Ohio.

Seasonal production as indicating laying capacity. Oreg.

The relation of plant carotinoids to poultry production. Relation to growth, fecundity and reproduction. Physiological relation between fecundity and the natural pigmentation of certain breeds of fowls. Influence of specific feeds and certain pigments on the color of egg yolk and body fat of fowls. Missouri.

Is type or conformation correlated to egg producing qualities? Oreg.

External characteristics of the hen as indicating laying capacity. Oreg.

Increasing weight of brown and white eggs. Okla.

Feeding and fattening, general. (See also Animal nutrition.)

Chicken feeding tests. To determine the most desirable feeds and feeding methods in connection with chicken production under local conditions. Guam.

Feeding for egg production. Idaho.

Feeding investigations. Ind.

Poultry feeding. To devise a simple ration for feeding poultry. Md.

Cockerels, capons, and pullets compared for meat production, as regards rate, economy, and character of product. Ohio.

Crate fattening roasters. Mont.

Fattening poultry. N. Dak.

A study of the several feeds to determine the relative efficiency and economy in egg production. Ala.

Simple and variety rations for laying hens. Ohio.

Effect of varying proportions of mash and grain for laying hens. N. J.

Different methods of supplying grain and mash for laying hens. Ohio.

Green food for egg production. W. Va.

Poultry, feeding and fattening (Cont.).

Feeding experiments with poultry relating to the importance of coarser vegetable foods and the utilization of waste foods. N.Y. State.

Poultry feeding experiment to test the value of common local grain and by-products as poultry feed, such as kafir, milo, and cotton-seed meal. N.Mex.

The use of barley for laying hens. Calif.

Value of hullless barley, oats, corn, and peas in the egg ration. Mont.

Comparison of corn and wheat alone and combined as the principal ingredients of rations for laying hens. Ohio.

Investigation to find the relative value of wheat, hulled rice, and paddy rice as grain feed and of wheat shorts v. rice polish in mash for laying hens. Calif.

An experiment to determine the effect of smutty wheat on the health and productiveness of a normal flock of fowls. Calif.

Calcium requirements of chickens. Wis.

Flock maintenance. N.Dak.

Feeding, use of protein supplements.

Rations containing various quantities of proteins for laying hens. Ohio.

Vegetable and animal sources of protein for laying hens. Ark.

Use of animal food in the mash. Iowa.

Animal v. vegetable protein in a laying ration. Ky.

Effect of organic nutrients from single v. mixed plant sources on the growth and reproduction of poultry. Wis.

Investigations on the value of tankage as compared with meat scrap. Ind.

Value of meat scraps in a laying ration. Ind.

Effect of varying amounts of meat scrap in rations for laying hens. N.J.

Comparison of tankage and meat scrap for laying hens. Ohio.

Poultry, feeding, protein supplements (Cont.).

Investigation to find the relative values of meat scrap, digester tankage, blood and bone meal, soy bean meal, O.P. linseed meal, coconut oil, cake meal, and alfalfa meal as protein feeds for laying and breeding hens. Calif.

A comparison of the protein in beef scrap, cottonseed meal and peanut meal as a suitable source of protein for egg production. Okla.

Comparison of feeding value of beef scraps, tankage, and cottonseed meal as feeds for egg production. Tex.

A study of several feeds, beef scrap, skim milk, peanut meal, and velvet bean meal, as a source of part of the protein in the ration, to determine the relative efficiency of each feed as influencing the egg yield and the cost of egg production. Ala.

Investigation to find the relative value of soy bean meal, meat scrap, buttermilk and O.P. linseed oil meal as high protein feeds for laying and breeding hens. Calif.

The value of sour skim milk, beef scrap, cottonseed meal, gluten meal, and oil meal in rations for egg production. To obtain the feeding values of meat scrap, sour milk, gluten meal, cottonseed, and oil meal when fed to laying hens. Missouri.

Feeding value of dried buttermilk. Ind.

Feeding value for egg production of cottonseed meal, peanuts, etc. Tex.

Fertility, incubation, and hatching of eggs.

Studies of factors influencing length of time necessary for male bird to be in pen to secure highest fertility point. Mich.

Studies of factors influencing number of eggs fertilized by one copulation. Mich.

Management and feeding as related to vigor of germ in hens' eggs. W. Va.

Egg hatching investigations, to determine the length of time eggs may be kept for the purpose of incubation. To study the effects of different methods of handling eggs previous to incubation. Md.

Problems of incubation and brooding. Mich.

Incubation tests to study the different kinds of incubators and their efficiencies under arid conditions. N.Mex.

The incubation of hens' eggs. Oreg.

Poultry, fertility, etc. (Cont.).

Incubation studies. Utah.

The influence of subnormal temperatures upon the growth of the chick embryo during the process of incubation. Conn. Storrs.

Incubation temperatures. Ind.

Determination of body temperature of hen during incubation. Mich.

Study of the hatching quality of eggs from the statistical and genetic standpoint. Mass.

Studies of individuality of the hen and other factors influencing hatchability of the eggs. Mich.

Management, housing, and artificial illumination.

Poultry management. Idaho.

A study of the relative profits to be derived from a farm flock of poultry as compared with a flock handled on a commercial basis. Ala.

An investigation to determine the relative effects of continuous confinement of the laying house, use of small yards attached to the laying house, on the health and productiveness of laying hens. Calif.

Comparison of wide range with close confinement of poultry. Ohio.

To devise and improve poultry equipment and methods used in handling poultry. Md.

Establishing systems for the detection of nonproductive hens in the flock. Mich.

An investigation to determine the value of artificial lighting to increase length of working day of laying hens in winter, and thus increase winter production of eggs. Calif.

Electric lighting of poultry houses. Ind.

Effect of artificial illumination in stimulating egg production. N.J.

Lighting poultry houses. Utah.

Marketing and distribution.

A study to determine the best age to market poultry. Ala.

Marketing farm poultry and eggs. Kans.

Poultry, marketing and distribution (Cont.).

Egg distribution to farmers for demonstration and improvement.
N.Mex.

Distribution of pure-bred cockerels. W.Va.

Turkeys.

Turkey experiments, to determine the possibility of increasing egg production and more uniform size for market purpose. N.Mex.

DAIRY FARMING.

Breeding, (dairy cattle.) (See also Genetics.)

Breeding dairy cattle. S. C.

Cattle breeding experiments (Dairy).. Maine.

Effect of inbreeding. Ohio.

A study of inbreeding and line breeding as opposed to out crossing in the breeding of dairy cattle. Idaho.

A comparison of line breeding and out crossing as systems of breeding dairy cattle. S. C..

Cattle breeding experiments for milk. The production of hardy milk stock for Alaska. Alaska.

Influence of feed, environment, and breeding on native unimproved cows, and their offspring, as regards development of milk-producing qualities, composition of milk, digestive capacity and utilization of feed in dairy and beef production. Iowa.

Dairy herd improvement. Ohio.

Improvement of dairy cows by grading up with pure bred sires. Nebr.

Development of dairy qualities in Galloways. To develop a hardy dairy breed. Alaska.

Breeding milking Shorthorns. W. Va.

The effect of exercise and feed upon the vitality and breeding ability of dairy bulls. Wash.

Investigations on the bovometric relations in dairy animals. Md.

Calves and heifers.

Feeding experiments with calves. Conn. Storrs.

Calf feeding investigations. Ind.

Feeding dairy calves. N. C.

Methods of handling and feeding dairy calves. W. Va.

Self feeder experiments with dairy calves. Mich.

Calf rations. Ohio.

Comparison of feed for calves. Iowa.

A chemical study of the nutrition of calves. Ind.

Dairy, Calves and heifers (Cont.).

Metabolism trials with young calves. Iowa.

Studies to ascertain the minimum quantity of butterfat necessary to produce normal development in a young growing animal. Oreg.

The study of milk substitutes for calf raising. Oreg.

Supplementing whole milk in raising calves. Md.

Raising calves on skim milk powder. N. Dak.

Oat hay v. alfalfa hay for skim milk calves. Calif.

Whole v. ground grains as feeds for young dairy calves. Calif.

Studies of the influence of the ration during the first two years upon the productivity of the resulting cow. Ill.

Influence of nutrition of heifers during their growing period upon their subsequent functional activities, size, vigor, and general usefulness. Missouri.

A study of the effects of alfalfa as exclusive food in the development of the dairy calf and heifer for dairy purposes. Calif.

Dairy calf feeding. To determine cost of raising dairy heifers without pasture, to maturity, to age of six months and to calving time. N. Mex.

Heifer development experiment. Kans.

Wintering dairy heifers. Va.

Cost of production. (See Rural economics.--Cost of production.)

Feeding experiments, general.

Dairy cow feeding experiment. Ky.

Feeding dairy cows, especially with Florida products. Fla.

Metabolism of fresh milch cows. Calif.

Metabolism in dairy cows. Penn.

Maintenance ration for dairy cows. Vt.

The minimum protein requirement for milk production. Penn. Inst. Anim. Nutr.

Feeding experiments, general (Cont.).

Determination of the protein and energy requirements for milk production. Va.

Effects upon milk production of varying amounts of the same feed. Penn. Inst. Anim. Nutr.

Relative utilization of energy in milk production and in fattening. Penn. Inst. Anim. Nutr.

Relative value of proteins of different feeds in the rations of dairy cows. S. Dak.

Effect of feeding different amounts of digestible protein to cows for a long period. Vt.

Twenty per cent y. twenty-four per cent protein for dairy cows. Md.

Wide, medium, and narrow rations for dairy cows. Ohio.

Utilization of farm products in milk production. Idaho.

Food requirements of growing dairy cattle. Nebr.

Winter rations for growing dairy cattle. Oreg.

Feeding experiments with concentrates.

A study of the relative efficiency of different concentrates in a ration for dairy cows. S. C.

Investigation of the relative economy of heavy and light grain feeding for California dairy cows. Calif.

Dairy rations.--To find the best amounts of grain to include in a ration with corn silage. Utah.

Barley y. corn for dairy cows. Wis.

Mill run y. barley for dairy cattle. Oreg.

A comparison of mill run y. bran and cottonseed meal y. coconut meal for milk production. Oreg.

Cottonseed meal y. coconut meal for dairy cattle. Oreg..

Coconut meal y. gluten meal for dairy cows. Md.

A comparison of buckwheat middlings and gluten feed for milk production. Penn.

Feeding experiments with concentrates (Cont.).

Preparation of corn for dairy cows. To study the relative economy and efficiency of various methods of preparing corn for dairy cows, including whole ear corn, broken ear corn, and cobmeal, shelled corn, and ground corn. Iowa.

Feeding value of corncob meal y. cottonseed hulls. Miss.

Comparison of feeding values for dairy cows of cottonseed meal, ground, whole pressed peanuts, and a mixture of the two. Tex.

The effect of peanut meal when fed to dairy cows on the qualities of the butter fat and methods by which this feed may be fed without undesirable effects. Ga.

Use of peanut meal and velvet bean meal in milk production. Fla.

To determine the relative feeding value of velvet bean meal and wheat bran as a part of the concentrate ration for milk production. Ala.

Determination of the most profitable proportions in which to mix Schumacher feed and ordinary cottonseed meal. Tex.

Feeding experiments with roughage and pastures. (For Silage see Feeding stuffs and Animal nutrition.)

Alfalfa and succulent feed for dairy heifers and cows. Calif.

The value of alfalfa silage for growing dairy stock. Calif.

Comparison of alfalfa with red clover for milk production. Ohio.

A study of sweet clover hay y. alfalfa hay as a feed for milk production. Nebr.

Rations for dairy cows. A comparison of alfalfa and silage, alfalfa hay and cottonseed meal, and alfalfa hay, silage, and cottonseed meal. Ariz.

Silage y. dry feed in milk production. N. C.

Use of succulent feeds for milk production. Water requirements of dairy cows on succulent feeds. Digestibility of Sudan grass. To determine the amount of water over and above that in the succulent feed, that is required by milk producing cows and the correlation between water consumption and milk production. Iowa.

Spineless cactus for milch cows. Calif.

Utilization of cereal straw for feeding dairy heifers and dry cows. Calif.

Feeding experiments with roughage and pastures (Cont.).

Acre value of pasture for dairy cows. Colo.

Sweet clover for pasture for dairy cows. Wash.

Herd management.

Dairy herd studies. Nebr.

Dairy herd maintenance. N. Dak.

Dairy herd production and maintenance. N. Dak.

Milking Shorthorn herd maintenance and cost of milk production
N. Dak.

Milk production under conditions prevailing in the cut-over areas.
Idaho.

A cooperative study of dairying under conditions of western
Nebraska. Nebr.

Studies in dairy production by high-producing cows. Calif.

Influence of shelter on milk and butter fat production. Tex.

The use of self-feeders in feeding dairy cows. Calif.

A comparison of early and late fall calving. Miss.

A test of material for bedding dairy cows. Penn.

Dairy sanitation. Mich.

Milking machines.

Investigations of the efficiency of the "Calf-way" milking machines.
Calif.

Studies of milking machines as a partial solution of the labor
problem. Ill.

A study of milking machines. Iowa.

Study of application of methods of cleaning milking machines to
farm conditions. N.Y. State.

Production of high grade milk with milking machines under ordinary
farm conditions. N.Y. State.

Studies on simplifications in methods of cleaning milking machines
and of new and better methods than those now in use. N.Y. State.

Milking machine experiments. S. Dak.

DAIRY PRODUCTS.

Bacteriology of dairy products.

Investigations in connection with raw and manufactured dairy products. Mich.

The influence of barn factors on the germ content of milk. Ill.

Species of bacteria found in dairy utensils. N.Y. Cornell.

The important factors in the production of sanitary milk and the means and methods of milk examination. N.Y. State.

Bacteriological examinations of certified milk. Calif.

A study of the true accuracy of bacterial counts as made from milk. N.Y. State.

The determination of the bacterial content of milk by a rapid method (little plate method). Wis.

The bacterial content of milk from milking to cooling. S. C.

Studies on cooling of milk in relation to its bacterial quality. N.Y. State.

The American high acid organisms found in milk. Iowa.

Acid production and the rate of growth of the lactic acid organism in the souring of milk. N.Y. State.

Studies on the bacterial flavors and odors of milk. Iowa.

A study of the *Torula* forms responsible for the yeasty fermentation in cream. Iowa.

The effect of preservatives on the bacteria in milk. Penn.

The use of available chlorin as a germicide in milk and milk products. Ark.

The bacteriology of butter. Okla.

A chemical and bacteriological study of the keeping qualities of butter. Ind.

A study of mold development on butter. Calif.

A study of the types of organisms present and multiplying in cottage cheese. Idaho.

Bacteriology of dairy products (Cont.)

Studies on the relation between the bacterial flora of good quality cheese and of good quality milk. N.Y. State.

Studies of the compounds in cheese and their changes under the influence of certain classes of bacteria. N. Y. State.

Chemical and bacteriological studies of ice cream. Ind.

Butter and butter making.

Influence of acidity of cream on flavor and keeping qualities of resulting butter. Iowa.

The neutralizing of the acidity of cream for butter making. Oreg.

The effect of neutralization on the quality of butter. N.Y. Cornell.

The chemistry of churning. Missouri.

The cause of difficult churning. Wash.

Factors influencing grade of butter. Okla.

A study of California butter at the Davis and San Francisco markets. Calif.

Comparison of creamery and market weights of butter. Wis.

Study of dairy plant records. N.Y. Cornell.

Creamery building and improvement. N. C.

Keeping qualities of butter. Mich.

Keeping quality of butter in storage as affected by methods in making. Minn.

A chemical and bacteriological study of the keeping qualities of butter. Ind.

A study of mold development on butter. Calif.

The bacteriology of butter. Okla.

Scoring contests of commercial creamery butter. Idaho.

Cheese and cheese making.

Mountain cheese work. N. C.

Cheese making. N. C.

Cheese and cheese making (Cont.).

Cheese investigations. Wis.

A study of the manufacture of cheese and whey. Calif.

Studies of the compounds in cheese and their changes under the influence of certain classes of bacteria. N.Y. State.

Factors concerned in the coagulation of milk by heat. Wis.

Yield of cheese from milk high and low in fat. Wis.

Pasteurization of milk for cheese making. N.Y. Cornell.

The effect of clarifying milk for making Cheddar cheese. N.Y. Cornell.

Studies in cheese making. Effect of temperature of cooking on texture of cheese; effect of amount of rennet or pepsin on rapidity of curing cheese; the possibility of curing cheese in Oklahoma factories; controlling factors in proper handling and marketing of cheese in Oklahoma. Okla.

The effect of separating temperatures on the loss of fat in separated whey. Oreg.

Studies on the relation between the bacterial flora of good quality cheese and of good quality milk. N.Y. State.

A study of the types of organisms present and multiplying in cottage cheese. Idaho.

A study of the control of mold development in cheese-curing rooms. Calif.

The use of Bacillus bulgaricus starter for controlling gassy milk in the manufacture of Cheddar cheese. Calif.

The effect of washing curd on the yield and quality of Cheddar cheese. N.Y. Cornell.

The use of pepsin as a substitute for rennet in the manufacture of California (granular) and Cheddar cheese. Calif.

Studies in the manufacture of Swiss cheese in vats. Oreg.

The manufacture of Camembert, Swiss, and albumin cheeses. N.Y. Cornell.

Cheese making.--(Cottage, Neufchatel, whey, Romano, etc.) A study of the practice of cheese making with special reference to the manufacture of foreign cheeses. Vt.

Cheese and cheese making (Cont.).

Relation of moisture and acidity to keeping quality of Neufchâtel and cream cheeses. N.Y. Cornell.

The manufacture of cottage cheese from a mixture of skim milk using Bacillus bulgaricus starter for curdling the milk. Calif.

The manufacture of a skim milk cheese that will keep. S. Dak.

Cream production.

A study of some factors affecting the texture of the cream. Calif.

Losses in farm skimming of cream. N. C.

Factors affecting the efficiency of hand separators and causes of variation in cream tests. Nebr.

A study of the efficiency of the various cream cooling tanks. Nebr.

Cream routes. N. C.

An investigation regarding the whipping of cream. Wash.

A study of the *Torula* forms responsible for the yeasty fermentation in cream. Iowa.

Ice cream studies.

Ice cream investigations. Kans.

Studies in ice cream making. Okla.

Commercial ice cream making. Okla.

Testing ice cream for butter fat. A comparison of various acids as to time required, ease of manipulation, character and accuracy of test; comparison of different ingredients upon character of test, such as sugar, gelatin, gum tragacanth, and ice cream powder, fruits, eggs, and color material; influence of method of obtaining samples, time cream has been packed and manner of packing; comparison of results with cream and milk bottles; effect of emulsifying and homogenizing upon ease with which test may be made. Okla.

Chemical and bacteriological studies of ice cream. Ind.

A study of the factors affecting swell in ice cream. Calif.

Factors affecting the formation of ice crystals in ice cream. N.Y. Cornell.

Ice cream studies (Cont.).

Fillers in the manufacture of ice cream. Wash.

Milk, secretion, composition, and supply.

An investigation of physiological and chemical changes taking place within the mammary gland during secretion. Md.

Certain problems relating to the biochemistry of milk formation in the udder. N.Y. State.

Milk secretion studies, using condemned tubercular cattle. The study of the source of milk solids. Vt.

Synthetic capacity of the mammary gland. Wis..

Feeding galactose to dairy cattle. Del.

The influence of barley on the milk secretion of cows. Calif.

Investigations into causes of variation in milk and fat production. Effect of individuality of cows upon milk and fat yields. Influence of alimentary fat on the yield and composition of milk. Investigations on the influence of alimentary carbohydrates on the yield and composition of milk. Effect of proteins from restricted sources on the yield and composition of milk. Iowa.

Factors influencing or affecting the chemical and physical properties of milk. Missouri.

Analysis of milk records. To determine the age changes and the relation between total solids-not-fat and milk production, per cent fat, and butter fat. Maine.

Factors influencing the composition of milk; the influence of the plane of nutrition of the cow. Missouri.

A study of the composition of milk and fat--as affected by feeds, from different breed of cows, and with reference to the natural quantitative relationship existing between the various constituents of milk. Ohio.

Study of the chemistry of butter fat and the effect of food in modifying its chemical and physical character. Mass.

The effect of peanut meal when fed to dairy cows on the qualities of the butter fat, and methods by which this feed may be fed without undesirable effects. Ga.

Study of carbonic acid in milk. N.Y. State.

Milk, secretion, composition, and supply. (Cont.).

Carbonic acid in milk under various conditions after being drawn from the udder, and carbonic acid content as a basis for distinguishing between heated and unheated milk. N.Y. State.

Carbonic acid and carbonates in the udder. N. Y. State.

Acidity of fresh milk. N. Y. Cornell.

Conditions affecting hydrogen-ion concentration in milk. N. Y. State.

Acid production and the rate of growth of the lactic acid organism in the souring of milk. N. Y. State.

Investigation in the eradication of onion flavors from milk. N. C.

The enzymes of milk and their relation to abnormal flavors. Missouri.

Studies on the bacterial flavors and odors of milk. Iowa.

The toxicity of milk. Iowa.

Effect of diseases in the cow on milk. Mich.

The investigation of the food value for infants and invalids of various milks. Md.

Studies regarding the nutritive value of milk, its suitability for food for children and animals, conditions which affect its nutritive value, tolerance, and related questions. Vt.

Study of city milk supply. N. Y. Cornell.

Studies on methods of controlling and standardizing the quality of market milk. N. Y. State.

The important factors in the production of sanitary milk and the means and methods of milk examination. N. Y. State.

Study in the quality tests of milk. Oreg.

Tests for pasteurized milk. Wis.

Studies of minor factors in market milk distribution. Mich.

A study of the milk and cream supply furnished to University Farm creamery, with the object of working out a system of grading and paying for quality. Calif.

Milk, secretion, composition, and supply (Cont.).

The marketing of dairy products in Oklahoma. To ascertain general prices of butter fat, of milk and cream in all sections of the State at four periods of the year. The kind of market available; amount of butter-fat milk or cream offered for sale at centers in all sections of the State, methods of marketing and form in which butter fat is marketed; frequency of marketing and the factors determining prices. Okla.

Shipments of dairy products in New York State. N. Y. Cornell.

Study of dairy plant records. N. Y. Cornell.

The production, handling and marketing of milk and the making of butter under tropical conditions. Dairying in the tropics. P. R.

Milk testing.

Official dairy testing. N. Dak., Wash.

Advanced registry testing. Va.

Comparison of fat tests made by cow testing associations and local creamery. N. Y. Cornell.

Composite y. one day testing of milk samples. N. C.

AGROTECHNY.

Maple sugar and sirup.

Studies in cost of maple sirup production. Mich.

Study of manufacture of maple sugar and sirup in New York. N.Y. Cornell.

Study of fundamental processes relative to the storage of sugars and other carbohydrates in the wood and inner bark of the maple. Vt.

Studies relating to the results of tapping on trees and maple sugar yield to answer the question as to whether the single trees should be tapped in one or a number of places during the single season. Mich.

Miscellaneous.

Sorghum sirup. Minn.

Investigation of the pickling of ripe and green olives, including a study of the oil content of immature and mature olives. Calif.

Agrotechny, miscellaneous (Cont.).

Investigations on the sulphitation and other clarification processes (in sugar making). La.

VETERINARY MEDICINE.

Anthrax.

Study of the means by which anthrax is disseminated. La.

Cattle diseases. (See also specific diseases.)

Clover bloat or tympany of the rumen in cattle and its cure. Ky.

An unidentified hemorrhagic disease in cattle. Nev.

Cattle loin disease in the Coastal Plains of Texas. Tex.

The control of udder infections. Oreg.

A study of cause of sterility in cows. Oreg.

Investigation of the so-called tick fever in Imperial Valley. Calif.

Control of calf lung worm. W. Va.

A study of immunization of cattle against blackleg by using aggressins manufactured in the laboratory, also a study of immunity produced by using powder vaccine of double strength. Okla.

Diagnosis and eradication of Johne's disease. Wis.

Contagious abortion. (See also Serum production.)

Contagious abortion. Colo., Conn. Storrs.

Investigation of contagious abortion. Wyo.

Contagious abortion in cattle. Mich., Minn.

Specificity of contagious abortion in cattle. Ill.

Infectious abortion.--Method and spread of the infection. Oreg.

The study of infectious bovine abortion; causes; control. Vt.

Investigations on contagious abortion and method of diagnosis. Wis.

Contagious abortion (Cont.).

Raising of contagious abortion-free stock from infected parents. To determine degree of infection of calves born of infected mothers and method whereby they may be reared free of disease. Ark.

Contagious abortion of mares and pyemic arthritis of foals. Minn.

Articular disturbances as related to abortion, sterility, and heavy milk production. Oreg.

The relation of shy breeders to subsequent abortion. Oreg.

Abortion observations. To determine if wheat product feeds tend to develop the abortion bacilli and if corn-fed products foster the growth of anti-bodies. Md.

Transmissibility of bovine infectious abortion to swine. Ark.

Immunizing horses and cattle against contagious abortion. Ky.

Treating for contagious abortion with methylene blue, carbolic acid, and lugol solution. Ark.

The preventative or curative properties of a commercial anti-abortion vaccine. Ark.

Immunization of heifers against contagious abortion by using abortion bacilli. Wis.

Use of killed and of sensitized cultures of abortion germ for cattle as a means of immunizing cattle against contagious abortion. Okla.

Field experiments with contagious abortion vaccine. Wis.

The possibility of another organism than B. abortus as a causal agent. Oreg.

External parasites of man and live stock. (See also Economic Entomology, Parasites, external.)

Insects and parasites affecting live stock, including the screw worm, wool maggot, and goat louse. Tex.

Determination of the comparative effectiveness of the more promising "fly repellants" when applied to wounds, sores, and cuts. Tex.

External parasites of man and live stock (Cont.).

Dipping Angora goats to exterminate the goat louse (Trichodectes climax). Tex.

Hairlessness and goitre.

The cause and prevention of hairless pigs. Mont.

Hairlessness and goitre studies. N. Dak.

Goitre and associated conditions in domestic animals. Wash.

Effect of iodine on swine. Iowa.

The effect of iodine fed pregnant ewes upon size, vigor, bone, and condition of offspring. Iowa.

Hemorrhagic septicemia.

Hemorrhagic septicemia in cattle. Oreg.

A study of the pathogenicity as well as antigenic and biologic properties of the organisms belonging to the hemorrhagic septicemia group. Nebr.

Hemorrhagic septicemia in sheep. Oreg.

Hog cholera. (See also Serum production.)

Hog cholera investigations. Minn.

Study of swine epidemic, with special reference to hog cholera and its complications. Mich.

Study of hog cholera virus--hog cholera exposure experiments. Ind.

The isolation and cultivation of the specific microorganism of hog cholera and the investigation of methods of treatment based upon a vaccine. Ky.

Tests to determine whether or not hog lice would transmit hog cholera. Ala.

Investigations of tuberculosis in virus hogs. Ind.

To determine the age at which pigs from immune mothers become susceptible to hog cholera. Md.

A record of the results of hog cholera immunization at the University Farm. Calif.

Hog cholera. (Cont.).

To obtain the percentage of double treated hogs that may later become susceptible to cholera; to find the proper age that pigs may be immunized by the double treatment, and length of time immunity of double treated pigs may be expected to last. Md.

To test the efficiency of anti-hog cholera serum in the control of the disease. Mass.

An experimental study of hog cholera and the factors concerned in immunity against the disease. Missouri.

A systematic study of the fundamental facts underlying the development of hog cholera immunity and hyperimmunity. N. Dak.

A study of immunity in vaccinated hogs. Okla.

A study of the vitality of hog cholera virus. Okla.

Horse diseases. (See also specific diseases.)

Equine anemia. Nev.

Causes and transmission of infectious anemia. Mont.

Swamp fever in horses. N. Dak.

Swamp fever or infectious anemia in horses and mules. Tex.

Transmission of swamp fever in horses. Wyo.

Studies on the so-called walking disease of horses in the wheat belt of eastern Oregon. Oreg.

Contagious abortion of mares and pyemic arthritis of foals. Minn.

Immunity. (See also specific diseases and Serum production.)

Studies on the role of immunity-inheritance and transformation as a means of combating communicable diseases in animals. R.I.

The agglutination test as a method of diagnosis. Oreg.

Blood complement studies. Vt.

Necrobacillosis.

Necrobacillosis- a study of the various activities of Bacillus necrophorus. Wyo.

An enquiry into the nature of necrobacillosis in young pigs. Nebr.

Necrotis stomatitis or sore mouth disease. Colo.

Parasites. (See also Sheep and Poultry diseases.)

Life history and control studies of pathogenic parasites of food animals. Mich.

Parasitic diseases of domestic animals of Guam. To determine the extent of parasitic infestation among the domestic animals of Guam. Guam.

The endoparasites of man and domesticated animals. Minn.

The prevalence of intestinal worms in pigs. Ala.

Embryology of tapeworm investigations. Kans.

The ox warble fly. Ohio.

Cattle tick experiments, to determine the general effect of ticks and tick treatments upon pure bred, grade and native cattle. Guam.

Test of a number of vermicides for efficiency in combating intestinal parasites. Ohio.

Gathering notes and specimens furnished by the station experiments, by post-slaughter examination of animals at the station or at packing plants, by correspondents or by field investigations. Ohio.

Poisoning and poisonous plants. (See also Botany and Chemistry.)

Forage poisoning. Ill., Miss.

Food poisoning in sheep and cattle. Colo.

Field and laboratory investigation of the nature and etiology of forage poisoning. Ind.

Poisonous range plants. Nev.

A study of the distribution, cause, and control of the disease known as "trembles" or milk sickness, in farm animals. N. C.

Poisonous effects of rose chafers. Conn. Storrs.

Cottonseed meal poisoning. La.

Investigations on the toxicity of cottonseed meal to swine. N. C.

Age as a determining factor in cottonseed meal poisoning. Hogs of different ages to be fed cottonseed meal and corn chops. Miss.

Beet pulp and molasses poisoning. Utah.

Poultry diseases. (See also specific diseases.)

Chicken diseases. Colo.

Bacterial study of poultry diseases. Kans.

A report of inquiries from poultry raisers of California in regard to outbreaks of disease among their flocks. Calif.

Etiology and pathology of fowl cholera. Methods for prevention and control. R.I.

Investigation of roup (avian diptheria) and chickenpox (epithelioma contagiosum.) Calif.

Relation between adequacy of diet and immunity to roup. Kans.

The vaccination of pullets against chickenpox. Conn. Storrs.

White diarrhoea in chickens. Conn. Storrs.

A study of the bacterial infection of eggs, with special reference to the bacteria of fowl cholera, fowl typhoid, and bacillary white diarrhoea. R.I.

Poultry vermin. Okla.

Studies of the life histories of the chick tapeworm (Choanotoenia infundibuliformis) and the chick nematode (Heterakis perspicillum.) Kans.

The gapeworm of poultry. Ohio.

Gapeworms in poultry, to determine method of transmission and find a remedy. Mi.

Eradication of gapes on the farm. W. Va.

Parasitic and disease carrying worms of fowls. Minn.

The proventriculus and gizzard worms of fowls. Minn.

Round worms and tapeworms of poultry. Okla.

Poisonous effects of rose chafers. Conn. Storrs.

Blackhead disease of turkeys. R.I.

Study of blackhead in turkeys. Conn. Storrs.

Investigations of an infectious disease affecting and destroying large numbers of ducklings in the State, known as "keel" or staggers. Conn. Storrs.

Serum production.

Special biological products. Minn.

Preparation and distribution of biological products. Ky.

Serum production. Febr.

Serum production and distribution. N. Dak.

Serum production. Investigation of methods of manufacturing.
Dorset-Niles anti-hog-cholera serum. Ind.

Technical improvements in the manufacture of hog cholera serum
and virus. Calif.

Concentration of hog cholera serum and the precipitation of the
immune bodies. Calif.

Studies of preservatives for hog cholera serum. Wis.

Curative properties of anti-hog-cholera serum. To determine the
stage of the disease at which vaccination is no longer of avail
for cholera-infected hogs, and to determine whether anti-hog
cholera serum has any positive curative properties. Ark.

Investigations in regard to production of serum to protect against
infectious abortion. Ind.

Sheep and goat diseases. (See also specific diseases.)

Sheep losses in feed lots. Colo.

Treatment for caked udder in sheep and goats. Tex.

A study of swell head of sheep and goats. Tex.

Stomach worms in sheep. Okla.

Stomach worms in sheep and goats. Experiments with a view to
ridding the animals entirely from the worms in such a manner as
to involve the minimum amount of labor. Tex.

Animal parasites. Effect of changing pastures on parasitic in-
festation of sheep. Ohio.

Lung worms of sheep. Okla.

Life cycle of Thysanosoma actinoides, a common tapeworm of sheep.
Wyo.

Sheep and goat diseases (Cont.).

Life history of Sarcocystis tenella, parasitic in the muscles of sheep. Wyo.

Swine diseases. (See also specific diseases.)

An enquiry into the nature of necrobacillosis in young pigs. Nebr.

Field and laboratory study of "mixed infections" diseases of hogs.

The pathological effect produced by bacteria causing "mixed infections" diseases of hogs and methods of prevention. Ind.

Systematic study of a hog disease of unknown origin. La.

Tuberculosis.

Factors controlling the metabolism of bovine tuberculosis bacilli. Wash.

A study of the causes and means of preventing the spread of tuberculosis in cattle and hogs in California. Calif.

The intradermal test for detecting tuberculosis in cattle and swine. Calif.

Tuberculin testing of cows in certified dairies. Calif.

The immunization of calves to tuberculosis. Calif.

Tuberculin tests. Minn.

Vaccination against tuberculosis. Wis.

Avian tuberculosis. Wis.

The control of avian tuberculosis. Mont.

Miscellaneous.

Diseases of farm animals. Kans.

Studies of animal diseases. Mich.

General research and investigations of animal diseases. Ky.

Investigation of obscure diseases. Minn.

Miscellaneous veterinary work. N. Dak.

Laboratory examination of carcasses and tissues of animals from outbreaks of diseases. Ind.

Veterinary Medicine, Miscellaneous (Cont.).

Death of animals and cases of serious sickness at University Farm. Calif.

Cause of an unnamed animal disease occurring in the eastern Cascade Counties of Washington. Wash.

Effect of diseases in the cow on milk. Mich.

Studies in normal anatomy, histology, physiology, and pathologic conditions and parasitism. N. C.

Normal temperatures of live stock in Guam. To determine the normal temperature of cattle, horses, and caribos under Guam conditions. Guam.

The vaginal mucous. Oreg.

RURAL ENGINEERING.

Clearing land.

Clearing land. Idaho, Oreg.

Land clearing investigations.--Comparison of various strength of dynamite for blasting pine and hardwood stumps on various types of soil. Comparison of cost of stumping pine and hardwood stumps on various types of soil when dynamite is used alone, when large stumps are cracked with dynamite and then pulled with capstan puller, when large stumps are pulled first and then split with dynamite, when stumps are pulled with one-man puller, when stumps are split and pulled with block and line. Studies on time of brushing and seeding cut-over land. Wis.

Drainage.

Drainage and improvement of wet soils. Studies of the water table, outflow, and alkali conditions in the irrigated sections of the State. Oreg.

Drainage of swamp and overflow lands. Ala.

Miscellaneous drainage investigations. Calif.

Drainage requirements of crops and drainage factors. Colo.

Drainage systems. Mont.

Farm drainage.--Surveys, with plans and recommendations. Ala.

Drainage (Cont.).

Preliminary drainage survey of Imperial Valley. Calif.

Survey of proposed warm creek drainage district. Calif.

Valencia County Drainage District No. 1, 17,000 acres on the east side of the Rio Grande in Valencia County running along the river for about 15 miles south of the Indian lands. N. Mex.

Bernalillo County Drainage District No. 3, 6,000 acres running south of Albuquerque on the east side of the Rio Grande. N.Mex.

Bernalillo County Drainage District No. 2, 13,000 acres on the east side of the Rio Grande, north of Albuquerque. N. Mex.

Bernalillo County Drainage District No. 1, includes 12,000 acres in Bernalillo County west of the Rio Grande at Albuquerque. N. Mex.

Survey to determine feasibility of the drainage of Little Lake Valley. Calif.

Drainage and irrigation feasibility survey. Oreg.

General survey to determine cause and extent of water-logging in Imperial Valley. Calif.

Farm buildings and equipment.

Farm structures.--Farm houses; general farm barns, cattle barns; dairy barns; horse barns; poultry houses; swine houses; sheep sheds; buildings for crop storage, granaries, corn cribs, potato storage houses, root cellars; milk houses; smoke houses; manure pits; machinery sheds; garages; power plants; tenant houses; fruit storage buildings; seed corn houses; farmsteads. Iowa.

A study of representative types of Indiana farm buildings. Ind.

Plans for beef barns. Calif.

The design and construction of dairy barns in various parts of the State. Calif.

An investigation into the efficiency of various barn ventilating systems. To determine the relative efficiency of ventilating systems like King and Rutherford. To test the method in use at the new dairy barn and to compare the results with other barns equipped or not equipped with ventilating systems. Iowa.

Farm buildings and equipment (Cont.).

An investigation into the efficiency of various barn ventilating systems. Iowa.

Silo building. N. C.

Capacities of silos. Mich.

Silo wall treatment. Iowa.

Silage investigations. To study all conditions regarding use of silo, including material of wall, moisture content, shock corn, fodder, loss of nutrients in silo, silage from legumes, capacity of silos of different depths. Missouri.

Drainage and paving for feed lots. Calif.

Equipment for live stock feeding and management, including feed bunks, alfalfa racks, mixing box, dipping tank combination, sheep rack, and other miscellaneous equipment; self feeders for swine, specifications and construction; small farm elevators for live stock farms, specifications and construction; beef cattle barn- Iowa State College, specifications and construction. Iowa.

Hog house investigations. Nebr.

The design of hog houses. Calif.

Poultry house construction. Idaho.

Housing pure bred poultry. Ky.

Design of transportation laying house. Calif.

Plans for sales pavilions. Iowa.

Design of rabbit hutch. Calif.

Equipment for the storage and handling of manure. Calif.

Farm machinery.

A study of motor cultivation. Iowa.

Tests of traction equipment for tractors. Iowa.

Tractor farming. Mont.

Tractor investigations. Iowa.

Economic study of farm tractors. Mont.

Farm machinery (Cont.).

An investigation of the status of the farm tractor in Indiana.
Ind.

Investigations to determine the draft of various farm implements and the cost of different operations with them. To determine the draft of various tillage and other farm implements, the effect of different soil types on draft, and the effect of the different treatments of soils on the draft of various implements. Also to determine the cost of different operations.
Missouri.

Draft of farm implements.--Farm power. Mont.

Study of the draft of farm implements. Iowa.

Power required for plowing. Calif.

Weeders and mulchers. Mont.

A study of lime and fertilizer distributors. Iowa.

Studies of labor-saving machines, including ensilage harvesters, corn picker huskers, small threshers, small ensilage cutters, grain shockers, shock movers, silage packers. Iowa.

Farm water supply, sewage disposal, and sanitation.

Water storage tanks. Iowa.

Design of tank houses for Land Settlement Board project. Calif.

Farm sewage disposal. Idaho.

Sewage disposal. Observations on the operation of the various units of the experimental sewage plant. Mont.

Purification of creamery sewage. Wis.

An investigation of sanitary conditions on farms and experiments to determine the best types of sanitary equipment. To determine the actual sanitary conditions as they exist on typical farms, and the economy and efficiency of different kinds of sanitary equipment. Missouri.

Irrigation.

Underflow studies. Ariz.

Use of water from Kings River. Calif.

Irrigation. (Cont.).

Ground water development.--An investigation of the valleys of the State and to map the same to show where artesian water is available for irrigation and for culinary purposes. The pressure of the water, the flow of the wells, and the nature of the supply reservoir is studied for all the artesian well districts. Utah.

The use of farmers' measuring devices for irrigation water and duty of water. Mont.

The Venturi flume. Colo.

Study of conditions affecting operation and accuracy of types of current meters for determining water velocity in open channels. Colo.

Irrigation investigations with field crops. Demonstration of measuring devices. Calif.

Pumping for irrigation throughout California. Calif.

Pump irrigation. Nebr.

An investigation of irrigation pumping machinery. Ariz.

Pumping for irrigation. Utah.

Pumping water for irrigation. Utah.

Pump irrigation at the North Platte Station. Nebr.

Design and supervision of installation of irrigation pumping plant and pipe distribution system, including supervision of preparation of land for irrigation on a 200-acre farm near Yuba City, Calif. Calif.

Manufacture of concrete irrigation pipes. Calif.

Experiments in the distribution of water and improvement of irrigation practices. Oreg.

The preparation of land for alfalfa irrigation in northern and central California, mostly in Sacramento and San Joaquin Valleys, to a small extent in the alfalfa sections around Pomona, Ontario, and Corona. Calif.

Duty of water for alfalfa and disposition of irrigation water in Imperial Valley alfalfa fields, near El Centro. Calif.

Amount of water to apply. Size of irrigation. Utah.

Irrigation (Cont.).

Duty of water in foothills of Yuba and Nevada Counties, California. Calif.

Duty of water in rice irrigation in California. Calif.

Cooperative duty of water investigations. Oreg.

Investigations on the duty of water in plant growth. Idaho.

Reconnaissance of California practice in the irrigation of deciduous orchards. Calif.

Sevier County Farm irrigation experiments, conducted with sugar beets, potatoes, and alfalfa to determine the duty of water in the Sevier valley and to determine the best methods of applying it. Utah.

Irrigation practice at Greenville with beans, potatoes, oats, alfalfa. Utah.

Irrigation of orchards and small fruits. Calif.

Irrigation of vineyards. Calif.

Vegetable irrigation at Davis. Calif.

Experiments with varieties and with cultural methods for forage crop and grain production under both irrigation and dry farming at an altitude in excess of 6,000 ft. Idaho.

Irrigation investigations with field crops. Calif.

Alkali and plant food under irrigation and drainage conditions. N. Mex.

Ground water studies in the Socorro Valley, New Mexico.--To determine the cause of the rise of the ground water, rate of rise, and approximate damage done. N. Mex.

Rate and cause of rise of ground water in the Mesilla Valley, New Mexico. N. Mex.

Survey of composition of irrigation waters. Utah.

Evaporation experiments. Colo.

Irrigation experiments. Nev.

Study of relations of soil water and crop in respect to irrigation and dry farming supplemented by irrigation. N. Mex.

Irrigation (Cont.).

Irrigation and drainage feasibility surveys. Oreg.

Irrigation survey of portion of Byron-Bethany irrigation project in San Joaquin, Alameda, and Contra Costa Counties. Calif.

Mutual irrigation companies in California. Calif.

Irrigation institutions. Utah.

General irrigation investigations in California. Calif.

Improvement of water laws. Oreg.

Seepage in the Gallatin Valley. Mont.

Materials of construction.

Preservative treatment of fence posts and shingles. Iowa.

Preservative treatment for wood silos. Calif.

Comparison of fence posts. Minn.

Treatment of fence posts to increase desirability. Penn.

Fence post treatment. Mont.

Fence post preservation. Minn.

Alkali proofing and preparation of alkali proof cements. Wyo.

Roofing materials. Iowa.

Miscellaneous.

Road materials and road building in Colorado. Colo.

Making ice on the farm. S. Dak.

RURAL ECONOMICS.

Cost of production and accounting. (See also Animal Husbandry--
Cattle, Swine, Horses and
Poultry, and Dairy Farming.)

Cost of production. N. Dak., W. Va.

Cost accounts. Iowa

Farm cost accounting. Mont.

Cost accounting on Wisconsin farms. Wis.

Cost of production and accounting (Cont.).

- Cost accounting and agricultural surveys. N.Y. Cornell.
- Farm organization and cost of production investigations. Kans.
- Cost studies in farm management. Vt.
- Cost of producing farm products. Minn.
- Cost of producing farm products under farm conditions. Missouri.
- Cooperative studies in the cost of producing farm crops. Ind.
- Cost accounting with special reference to cost of wheat production. N.Dak.
- Study of cost of production of cotton and farm organization. Tex.
- Investigations into the financial side of farming as applied to the production of fruit, field, cereal, and other crops of a similar nature. Calif.
- Cost of producing fruits. Minn.
- Cost accounting in citrus groves to find the cost of producing citrus fruits in Porto Rico. P.R.
- A study of cost accounting for citrus orchards with a view to determining as far as possible the actual value of cultural practices. Calif.
- Cost of beef production. Iowa.
- Cost of production of pure bred beef cattle. Ark.
- Cost of maintaining a beef breeding herd. Ohio.
- Hogs, cost of production. N.Dak.
- Survey study of cost of hog production. Iowa.
- The cost of pork production when grain is fed in conjunction with alfalfa pasture. Calif.
- Cost of wintering brood sows and cost of pig at weaning time. Del.

Cost of production and accounting (Cont.).

Horse cost and hours work. N. Dak.

Cost of horse power - To determine the cost of horse power at the Oregon Agricultural College where all items of feed, harness and shoeing are charged. Oreg.

To determine the cost of production of mature pullets. Mont.

Cost of producing eggs, including merits of breeds. Ark.

Cost of egg production. N. Dak.

A study to determine the cost of raising dairy calves. S. C.

The cost of raising dairy heifers. Ohio.

The cost of growing dairy cows. Iowa.

Cost of milk production. Conn. Storrs.; N. Dak.; Ohio.

Cost of milk production in Nebraska. Nebr.

Procuring data relative to the cost of producing market milk. Mich.

Cost of milk production and dairy farm organization. Wash.

Cost of milk from forced y. averaged dairy condition cows. Md.

Records of production, cost of feeding, and cost of milk production in tests of advanced registry of dairy cows. To secure records of production of registered dairy cows in Oklahoma; to secure feed records and methods of feeding dairy cows when under official test; to determine the cost of feeding test cows in Oklahoma; to determine cost of production of milk in tests of advanced registry to owners or breeders of dairy cows. Okla.

Cost of producing dairy products. Minn.

Cost of production of dairy cattle. Cost of production of milk and butter fat and of developing dairy calves. Ark.

Record of the station herd.--To ascertain the food cost of milk production, the cost of butter fat, and the dry and digestible matter required to produce a definite amount of milk and butter fat. Mass.

Methods and cost of distributing milk, with special reference to Oakland, Alameda, and Berkeley. Calif.

Cost of production and accounting (Cont.).

Milking Shorthorn herd maintenance and cost of milk production.
N. Dak.

A study of the animal cost of the production of milk for the
city supply and of butter fat for the creamery. Ill.

Farm labor.

Investigation of farm labor in Wisconsin. Wis.

Utilization of labor on the farm. Missouri.

Survey of labor income. W. Va.

A study of labor requirements and production costs of farm crops
and live stock in representative areas in Kentucky. Ky.

The farm labor program in Kentucky. Ky.

Labor required for harvesting alfalfa. Calif.

Farm organization and management.

Farm organization. Oreg., Utah.

Planning the Iowa farmstead, to bring together reliable data con-
cerning conditions on the Iowa farmstead that must be considered
when planning them for efficiency and beauty and also to formu-
late some principles and rules applicable to Iowa conditions.
Iowa.

Farm management survey. Oreg.

Farm management investigations and surveys. Kans.

Farm management survey in Warren County. Iowa.

Farm management survey in adjacent parts of Tama, Blackhawk, and
Grundy Counties. Iowa.

Economic study of farming in a representative community in the
east Tennessee Valley. Tenn.

Study of successful farms. Iowa.

Miscellaneous farm management studies. Utah.

Farm survey. Nebr.

An agricultural survey. W. Va.

Farm organization and management (Cont.).

A survey of 225 farms in Canadian County and other counties.
Okla.

General plans of farm organization and operation in different
sections of the State: Missouri.

Dairy farm organization and cost of milk production. Wash.

Notes on the management of the Thompson farm. Penn.

A forestry and farm management survey of northern Minnesota. Minn.

A study of farm organization under irrigated conditions in southern
Idaho.. Idaho..

Farm organization and cost of production investigations. Kans.

Systems of live stock management. The coordination of live stock
farming with units best suited for results, including sheep
raising on irrigated farms in Arizona, hog raising on Arizona
farms, a combination of hogs, beef cattle, and poultry on ir-
rigated land, and special cattle and sheep feeding operations.
Ariz.

Study of cotton farm organization and cost of production of
cotton. Tex.

Types of farming. Utah.

A test of grain y. live stock farming. Ohio.

A comparison of a live stock system with a grain system of farming.
S. Dak.

Investigations of systems of live stock farming based on cost
accounting work on twenty five farms. Ill.

Land settlement.

Methods employed by private land agencies in land settlement. Minn.

The application of the farm management idea to land settlement.
Oreg.

Examination of land settlement sites. Calif.

Land tenure.

Study of farm leases in Wisconsin. Wis.

Tenancy and farm leases. Minn.

Land tenure. (Cont.).

Investigations of tenancy, agricultural credit, and other land problems. Kans.

Iowa farm tenancy, with special reference to rental contracts. Iowa.

A study of farm tenancy in Tennessee. Tenn.

Land values.

Land value studies. Iowa.

Relation of various economic factors to farm values and to the contentment of the farmer. Tenn.

Marketing.

Market business practice. Minn.

Marketing farm products. Iowa.

Hemp marketing investigations. Ky.

Marketing of Wisconsin farm products.--Marketing of live stock. Wis.

Coöperative seed production and distribution. Minn.

Study of the balance of trade in food products covering the towns of Hampshire County and several towns and cities of Hampden County. Mass.

Coöperative marketing investigations. Tex.

The economic side of marketing and storing sweet potatoes. Tex.

Direct marketing in car lots. Nebr.

Studies of prices of farm products with a view to forecasting probable future needs. N.Y. Cornell.

Business organization and management of coöperative marketing associations. Minn.

Organization, cost and methods, cooperation. N. Dak.

The collection of statistics concerning farmers coöperative organizations in Minnesota. Minn.

Coöperative organizations, with special reference to grain elevators and live stock shipping associations. Iowa.

Marketing (Cont.).

Methods and cost of distributing milk, with special reference to Oakland, Alameda, and Berkeley. Calif.

Rural credit.

Study of farm credit in Wisconsin. Wis.

Investigations of agricultural credit, tenancy, and other land problems Kans.

Rural sociology.

Study of social relation of farm population in Dane County. Wis.

A social and economic study of a neighborhood. W. Va.

